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Strategic performance appraisal in team-based organizations: One size does not fit all

Scott, Susanne G; Einstein, Walter O

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ABSTRACT: The pervasive use of teams in today's organizations makes employee performance appraisal more challenging than in the past. Unfortunately, prescriptions offered in the business press often fail to consider the diversity of team forms used in team-based organizations. This article identifies 3 team types and examines the fit between performance-appraisal characteristics and team types. Performance-appraisal characteristics include target, type, and data source. The analysis underscores the critical need for effective leadership in designing and implementing performance appraisal systems in team-based organizations.

TEXT: Executive Overview

The pervasive use of teams in today's organizations makes employee performance appraisal more challenging than in the past. Unfortunately, prescriptions offered in the business press often fail to consider the diversity of team forms used in team-based organizations. Teams differ in their membership configuration, the complexity of their tasks, and level of interdependence from other organizational units. In this article, we identify three team types and examine the fit between performance-appraisal characteristics and team types. Performance-appraisal characteristics include target (individual or team), type (outcome, behavioral, or competency-based), and data source (manager or multirater). Our analysis underscores the critical need for effective leadership in designing and implementing performance appraisal systems in team-based organizations.

In the early 1990s, a prominent high-tech firm in the northeastern United States enthusiastically rolled out a new performance-management system to improve the performance of its professional work teams. The program was comprehensive, with details contained in two large, beautifully written, leather-bound volumes prepared by external consultants following nearly a year of work. Top management introduced the program with much public fanfare and pledges to implement it.
Three years after the launch, the second author happened to run into a colleague who was doing research at the firm on the human resource system and productivity:

Q: How's the performance management system working?

A: What performance management system?

The program introduced with such hope had come and gone within the space of a year, leaving in its wake frustration, anger, and cynicism.

This may be an extreme example. But it is no secret that many performance-appraisal systems fail to deliver their anticipated benefits in team-- structured organizations. Working with teams in our consulting practice has convinced us that onesize-fits-all performance-appraisal systems are largely to blame. A generic system applied across an organization ignores important differences among teams. For example, intact, colocated work and service teams still attend to the core work in many organizations, while virtual teams, geographically or organizationally dispersed, are used for more complex tasks.1 This trend has accelerated with the move from a manufacturing to a **knowledge -based** economy. In the

same organizations, we often see rapid-response teams of loosely networked professionals who manage strategic initiatives in the face of technology change, continued globalization, and hypercompetition 2

These are all teams, yet each presents a different challenge to performance management and its bedrock-employee performance appraisal. Employee performance appraisal influences motivation and development, provides documentary support for rewards and recognition, and links the activities of individuals to organizational effectiveness. But the movement to team-based structures in the 1990s raised new questions and revived old controversies regarding the efficacy of traditional appraisal systems.

For example, who should be appraised in team-- structured organizations-individuals or teams? Should the focus of appraisal be on attaining specified outcomes, or on nurturing appropriate behaviors to achieve those outcomes, or on acquiring competencies and skills? Should the focus be the same or different for individual and team appraisal? And who should provide the data on performance-ac manager who is not really part of a team? Other team members? Customers?

Designing effective performance-appraisal systems requires careful consideration of a number of team contingencies. In this article, we discuss three-team membership configuration, team task complexity, and the nature of the interdependencies among a team and external groups-that, when taken together, define three prototypical team types. We then specify the appropriate performance appraisal target, type, and data source for each type. To ground our discussion, we begin with a brief review of what is meant by employee motivation and performance, and specify how three different types of performance appraisal-- outcome, behavior, and competency-based-affect these processes.

Employee Motivation and Performance

Performance appraisal influences employee motivation by identifying and specifying mutually agreed on outcomes (outcome-based performance appraisal); directing attention to specific tasks, objectives, and assignments and specifying the behaviors that are needed to accomplish them (behavior-based performance appraisal); recognizing skill acquisition and identifying skill deficits for further training and development (competencybased performance appraisal); providing feedback on progress toward outcome attainment and actual task performance (outcome and behavior-based performance appraisal); and establishing the process and providing the rationale for distributing rewards (outcome-based, behavior-based, and competency-based performance appraisal).3
Outcome-based performance appraisal is used most successfully when it is part of a comprehensive goal-setting program that includes clearly defined, specific, challenging goals.4 Appraisal of behavior has possibly been the most used form over the last 30 or so years, and it involves identifying and rating observable behaviors relevant to individual work roles. Finally, competency-based appraisal consists of assessing an individual's skills or knowledge relative to that required to perform a specific job.5

Work Roles and Performance-Appraisal Criteria

Performance appraisal, whether outcome-, behavior-, or competency-based, traditionally focuses on the formal requirements of specific jobs. With the introduction of team structures, employee-involvement programs, and total quality management, employee roles in the workplace have expanded, and now include activities that go beyond task performance. The following work roles have been identified as important in today's workscapes:6

* Job role: Concerned with quality, quantity, and customer service provided.

* Context role: Being a good organizational citizen, continuous improvement of organizational processes, personal self-development in career, and continuous learning.

* Teamwork role: Collaborating in problem solving and conflict resolution, communicating openly, goal setting and performance appraisal of the team, as well as planning and task coordination among members.

Employee job-role performance contributes most directly through the organization's core technical processes, while performance in context and teamwork roles contributes to the broader organizational, social, and psychological setting in which job-role performance occurs.7 Generic performance appraisal systems that specify work-role definitions, behavioral descriptors, and competencies are available in the commercial market, or organizations can develop their own. In either case, it is important to involve employees and supervisors early in the process to assure their acceptance of the system.8 Mutual development by employees and supervisors of work roles, and the outcomes, behaviors, and competencies necessary for their enactment, serves four purposes:

* influencing employees and supervisors to think deeply about which of the roles are most supportive of department goals and of the organizational mission;
* providing specific direction on the behaviors and competencies needed to adequately perform in each role;

* communicating to supervisors which roles an employee is most interested in; this information can be considered for future job assignments;

* resulting in a concrete agreement between employees and supervisors on where time and energy will be focused.

Sources of Performance Data

Much has been written about the use of 360-degree (multirater) feedback as an effective tool for performance appraisal.9 At its most basic, a multirater feedback system gathers ratings of an employee's work-role behaviors from those in the best position to observe it, including subordinates, customers, and peers, as well as supervisors. Since its inception in the early 1990s, 360-degree performance appraisal has been criticized as often as lauded. A number of recent articles have summarized concerns with the validity of the measurement instruments, the process through which they are administered, and how the feedback is eventually used by organizations.10 Yet many scholars and managers agree that multisource feedback is fundamentally a good idea that deserves further development.

We will not review the technical discussions related to the validity of 360-degree feedback instruments, which have been thoroughly covered elsewhere,11 other than to note that such discussions are important with any performance instrument. Experts do agree that 360-degree performance appraisal should:12

* be used more for employee development than for making personnel decisions;

* be part of a formal goal-setting system;

* be administered on a regular basis rather than only once;

* provide aggregated, anonymous feedback to recipients;

* assure that raters evaluate employee behaviors only in work roles for which they have adequate knowledge and first-hand experience;

* provide orientation and training to performance raters;
* provide training and guidance on effectively interpreting and constructively using feedback to recipients.

Performance Appraisal Target: Team Member or Team?

Despite admonitions by many management scholars and consultants to abandon individual performance appraisal for team appraisal,13 U.S. corporations have been slow to do so. Their reticence may be justified, as team effectiveness is founded on individual behavior and performance, and individuals vary in the amount of effort and capability they bring to the workplace. Social loafing is likely to result when individual effort is not recognized and assessed. This conscious or unconscious tendency to shirk responsibilities by withholding effort toward group goals while sharing in rewards occurs more often when group members believe that their individual contribution (or lack thereof) cannot or will not be identified or assessed. People do show fewer signs of social loafing in small teams than in large groups, but they are still more likely to loaf when rewards (including recognition) are tied to team effort rather than individual effort.14 This tendency is markedly stronger in individualistic western cultures than it is in more collectivist societies such as Israel and Japan.15

If a team must support a free rider without recourse, other team members often withdraw effort.16 Social loafing spreads among team members like flu, poisoning the work climate. Individual performance appraisal helps discourage social loafing by providing each team member with feedback on the acceptability of his or her individual behavior, and on the need to further develop skills and competencies. High-ability team members are likely to be reassured that equity will be restored, and that all members will have the necessary skills and abilities to contribute.

Individual-level performance appraisal helps reduce social loafing, but it ignores the interaction and synergy that characterize excellent team performance. Team performance assessment gives a team the information it needs to identify team problems and to develop team capabilities. It heightens team pride and ownership, increasing commitment and identification of members with the team. Many team performance measurement systems, such as that at Xerox, are developed jointly by teams, managers, and customers as part of total quality management efforts.17 Joint accountability helps assure that the criteria and standards for performance are aligned with organizational and team strategies. Such measurement systems are largely outcome-based with some behavioral measures, but there is little reason that they could not also include team competencies. Teams are typically trained to prepare and interpret their own performance data as part of continuous improvement efforts.

Team Types and Performance Appraisal

In this section, we examine the fit of performance appraisal target, type, and data source with different types of teams. We begin by identifying three types of teams-work teams, project teams, and network teams-based on two important dimensions-membership configuration and task complexity. (See Figure 1.)

Membership configuration refers to the expected tenure of a team, the stability of its membership, and the allocation of members' work time, and it varies along a continuum from static to dynamic.18 Static teams are characterized by full-time team members, membership that remains constant throughout the life of the team, member expectations of a future, and a common level of activation or involvement of members throughout the life of the team. At the other extreme, dynamic teams are characterized by shorter tenure tied to task completion, members who come and go depending on task demands, and members who also work on other teams or nonteam tasks simultaneously.

The second team dimension, task complexity, recognizes that organizational teams engage in a wide variety of work that varies from the routine to the nonroutine.19 Routine tasks are well scripted and defined, and people encounter relatively few exceptions to the rule in completing them. Cycle time (the time needed to finish one complete unit of work) on routine tasks is specified in advance and is of relatively short duration. Outcomes are easily assessed soon after task completion against specific, quantifiable

criteria. In contrast, nonroutine tasks tend to be emergent-the desired outcome and the means to accomplish it are impossible to define in advance. At the extreme, everything encountered in performing a nonroutine task is an exception to the rule. Nonroutine tasks require applying multiple knowledge bases or skill sets learned through education in specific disciplines or through extensive training. Cycle time is longer on nonroutine tasks and indeterminate; at the extreme, cycle time can be decades, such as in developing a new drug.

FIGURE 1

The dimensions of membership configuration can vary independently. For instance, an airline flight crew is stable, with dedicated members, but of short duration. The dimensions of task type can also vary, but we find common patterns among them that define three types of teams used in organizations.

Work or service teams

At one extreme of membership configuration and task complexity, we find intact work teams engaged on routine manufacturing or service tasks. Those in production at Saab, Saturn, and Xerox are good examples that have been discussed often in the business media. These teams have been in existence for a long time, their membership has changed little or not at all since formation, and team members anticipate membership stability in the future. Members have similar skill sets and are cross-trained to perform many of the tasks necessary for the team to reach its goals. The team's tasks are standardized, cycle time is generally short, and multiple task cycles occur in each performance appraisal period. The team's output tends to be easily and objectively evaluated, there is minimal disagreement among stakeholders about the criteria for success, and feedback on performance is often provided by the task itself.

The work team is a well-developed social system. Members have interpersonal knowledge of each other's likes, dislikes, and personalities such that task interaction is more predictable. The quality of interpersonal relationships is important to all members. Trust reflects knowledge gained over time through experience with each other, but trust is also a matter of confidence that the needs, preferences, and goals of all team members are similar. This is enhanced by the team's regularly engaging in team building and training as an intact unit.

As shown in Table 1, individual and team performance appraisals are recommended for work and service teams. Conditions operating in these teams-an atmosphere of trust, expectations of a future together, shared knowledge of members' differences and similarities, and shared interest in the continuous improvement of the team members and the team-create an optimal environment for conducting performance appraisal at both the individual and team levels.

These same conditions make peer ratings a useful supplement to managers' evaluations of individual team members' behaviors and competencies assuming other conditions of use are met. For instance, the feedback report is used only for developmental purposes, and individual raters' anonymity is assured. Team members are in a good position to assess and certify each other's competencies related to job and nonjob roles, as they have personal knowledge of and experience with them. They also are in an excellent position to assess each other's job behaviors because they observe them daily. Since the team works together over multiple appraisal cycles, useful feedback can be given on improvements that have occurred in individual behaviors and competencies since the previous appraisal. The feedback report also provides a foundation for individual goal setting, and for a constructive dialogue among members on how to improve team functioning.

Outcome-based performance appraisal is recommended for the team but not for individual team members, as the tight interdependence among team tasks makes it difficult to accurately determine who did what toward achieving team goals. (If this is not the case, we question whether a team actually

exists.) Individual outcome-based appraisal shifts the team's focus from teamwork to individual work and promotes a view of teamwork as no more than the sum of the individual parts. It encourages finger pointing and assigning blame by the team rather than problem solving, and it undermines concepts of mutual accountability.

Table 1

Yet individual team member task proficiency is essential to team effectiveness,20 and feedback to team members on their own task accomplishment helps them regulate their own performance.21 Thus work and service team members are typically responsible for monitoring and documenting their own performance on individual tasks. This information is then used by the team as a whole to identify training and development needs and plan skill-building exercises for each member.
At the team level, measurement systems often reflect various types of outcome measures (e.g., productivity, sales volume, and customer complaints), and these act as a signaling device to the team for problem solving and corrective action. Teams are held accountable for monitoring and documenting their own performance against standard goals and against team goals, and they are also held accountable for results. When outcomes do not meet standard or team goals, teams are responsible for exploring potential sources of performance variability and for minimizing and eventually eliminating those over which they have control. Sources of variability outside the team's control are also identified and documented for management action. It is difficult to conceive of a situation where teams have 100 percent control over outcomes, and it is important that this be acknowledged. The weaker the effort-performance linkage (the more factors outside the team's control affect performance), the more important it is that behavioral measures be used to supplement outcome-based measures. Behavioral measures can include jointly attending team-training sessions during the performance cycle and arranging equal opportunities for all team members to master task proficiencies through job rotation.

Three hundred and sixty-degree feedback is sometimes collected on teams as a unit, and most of the same principles apply as those identified for individual multirater feedback. This type of feedback from internal and external customers can be especially useful when work teams are delivering a service and objective measures are difficult to identify. But care must be taken that raters actually assess the team as a unit rather than just the one or two members of the team with whom they interact.

Project teams

Project teams are distinguished from work teams by expectations of a limited future. Members are assembled for a specific purpose and they expect to disband once their task is complete. Well-known examples of successful project teams include the team that developed the first of IBM's PCs and the team that developed the original Taurus/Sable at Ford. Projects can range from relatively short to longer term, but members know they are on loan and will return to their functional areas on completion of the project.

Project teams engage in work that is outside the core production or **service work** of the organization and inherently less routine than that of work or service teams. Members typically come from different functional areas and have differentiated skills and knowledge bases; they lack expertise or deep understanding of each other's specialties. The difficulty and the tempo of team tasks vary across the life of the project and members' involvement waxes and wanes with project need. Project teams must learn and adapt to task realities.

As a result of their particular task demands and membership configuration, project teams tend to be focused more on tasks than on team members.22 Project teams have high goal interdependence among members-they are dependent on each other to meet project goals-but the degree of task interdependence among members varies considerably. Training and development

of members does not occur as an intact unit, and members are left to apply and integrate individual training with their team experience. Team members' competencies include functional expertise, political skills, creative problem solving, and critical decision making skills, but there is less emphasis on team self-management skills.23 Paradoxically, team self-management is often less appropriate in these teams of highly educated specialists than it is for work and service teams. Members are functional specialists rather than team specialists, and the priority on meeting project deadlines makes it difficult to engage in team training. In general, the less variable membership dynamics are, and the more routine the task, the more possible and desirable it becomes to move leadership and routine management functions into the team and to make members jointly responsible for team goal attainment. As team-membership dynamics become more fluid and team tasks become more specialized, there are greater needs for coordination and integration of the work across time, space, and members, and strong centralized leadership becomes more critical to goal accomplishment.

The determinant existence and shorter duration of project teams limits the usefulness of team outcome-based assessment because the project cycle does not coincide with the typical appraisal cycle. End-of-project outcome measures do not benefit the team's development as the team has likely dissolved by then. Instead, metrics are developed that relate to the various stages of a project so that teams can self-correct before things go too far off course. These include the continuous tracking of time, cost, and returnon-investment, as Hewlett-Packard does in its product development teams.24 Interim metrics are carefully designed with the input of project team members to eliminate or account for extraneous sources of variability that the team does not control.

Team members are expected to understand team metrics, work together to track them, revise them as needed, and use them to set downstream project goals. Multisource performance appraisal is particularly useful for rating performance of project team members on these behaviors and competencies. Because project team members are assigned and reassigned to different projects and often serve simultaneously on multiple teams, no one functional manager, team leader, or set of peers observes behavior over the many different work situations in which they perform. Under these circumstances, it makes sense to collect ratings from each of the team leaders and team members of the various projects an employee participates in during a performance cycle.

Project leader and peer ratings are good sources of behavioral ratings related to a team member's context and teamwork roles. But peers lack knowledge of other members' functional disciplines or understanding of their technical specialities, and they generally cannot assess the goodness or value of individual team members' inputs. As shown in Table 1, functional managers, who are responsible for technical mentoring, and who typically retain administrative responsibility for employees,25 are in a better position to provide behavioral ratings of job roles and to assess competencies pertaining to specific functional expertise. Functional managers and employees use the feedback report from peers and project leaders to identify developmental needs and schedule training. Thus people who are assigned to project teams as part of their job roles are rated on both their individual performance and their contribution in their team role. Training focuses on the development of behaviors and competencies that are transferable from one team assignment to the next.

Network teams

Network teams are virtual in that their potential membership is not constrained by time or space; they include geographically dispersed members who collaborate through a combination of telecommunications and information technologies.26 Their membership is not limited by organizational boundaries, and frequently includes contingent workers, customers, vendors, and consultants, as well as organizational employees. It is difficult to draw boundaries around a network team, as potential membership includes all who are committed to the goal.

Network teams also differ from project teams because their work is extremely nonroutine. Most network teams engage in one task cycle, the nature of which is unlikely to be repeated. For example, Fleet Focus, a team composed of dispersed specialists, was assembled by Fleet Financial Group of Providence, RI, to reorganize and reengineer Fleet's structure and processes during its acquisition of Shawmut Bank's portfolio in 1994. A similar network team functioned during Fleet's merger with BankBoston in 1999.

Membership configuration in these teams is dynamic, shifting in response to changing task needs, which are themselves emerging in response to rapidly changing environmental and technological conditions and from unique interactions among customers, suppliers, and team members. The timing and intensity of members' participation and the nature of the interaction and level of exchange among members is not scripted, but is dependent on task needs. Network teams are rapid-response units charged with strategically responding to market challenges and exploiting market potentials. Thus their primary competency is the ability to rapidly select and assemble the most appropriate member configuration for the task at hand, even when that task cannot be clearly specified. Team performance is a matter of strategic responsiveness.

The performance emphasis for team members shifts from what they did yesterday or last year to what they are willing and capable of doing tomorrow, where tomorrow is still largely undefined. Network teams, more than any other, rely on a cadre of potential members who are continuously engaged in self-directed learning to improve skills, knowledge, and competencies. Team members must be able to continuously reframe and rethink how things are done. Further, because membership configuration and task requirements are emergent and dynamic, collaborative, intensive communication is especially important to coordinating effort and achieving team effectiveness. Distant members must rely on electronic technologies to maintain coordinated action and commitment to goals. These include audio and video teleconferencing, chat groups, e-mail, bulletin board software, group decision-support systems, and project-management calendars.

Network teams are transitory structures that engage in unique tasks as they arise. Their performance cycle is at odds with annual performance--appraisal systems, and performance of the team as a whole is often not assessed in any formal way. However, there is evidence that this type of improvisational action is becoming increasingly important to organizations operating in highly turbulent industries, and it is important that their employees be prepared to participate in network teams as needed.27 Thus appraisal is focused on developing individual capacity to initiate, participate, and lead improvisational action, rather than on assessment of past outcomes.

Competency-based appraisal systems are optimal for assessing the potential of all employees to participate in network teams. Knowledge, behaviors, and skills, including individual adaptive ability, are appraised and used for evaluation and developmental purposes. Behavior-based appraisal can also be used to assess the extent to which employees participated in learning activities during performance cycles. These can be selfpaced programs, in-house training, or courses at educational institutions. To avoid simply rewarding attendance in training programs, employees are assessed on the extent to which they apply learning to current activities, set developmental goals, and seek out feedback from others as an input into the self-regulatory process.28 Finally, behavior-based appraisal is used to assess the extent to which members engage in collaborative communication and teamwork behaviors when participating in network teams. Multirater behavioral assessment is essential in networked organizations, because team members are working in multiple performance settings during any given performance cycle.

External Interdependence: A Final Contingency

Our analysis would be incomplete without considering the interdependencies among a team and other teams, individuals, and groups within an organization. At its simplest level, interdependence exists when a team is dependent on the contributions of nonmembers to complete tasks and goals. High interdependence exists when teams are dependent on multiple outsiders for information, resources, and support, and, when the need for the exchange emerges with the task, such exchanges are not well understood and procedures for them are not formalized. Low interdependence implies that teams are dependent on only a few outsiders, and procedures can be set up to manage the exchange of resources and information.
As the complexity of interdependence increases, teams face escalating needs to manage extensive interaction with others inside the organization. Care must be taken to assure that performancemeasurement systems focused at the team level do not encourage teams to optimize their own performance at the expense of other teams and the system as a whole. Motorola's experience with team incentive systems is instructive in this regard. The firm found that the outcome of focusing on team productivity in its production facility was anything but teamwork. While some teams did perform better, the cost of open competition, griping, and conflict among teams caused suboptimization in the plant as a whole?29 Team-focused outcome measures are important tools for team-development purposes, but the more the team is interdependent with others, the greater the need is to balance outcome measures with behavioral measures related to citizenship and teamwork with other teams.

Putting It All Together

One-size-fits-all prescriptions for performance appraisal methods are still all too common, despite strong differences among the types of teams commonly found in organizations. Further, the three types of teams we discussed here do not cover all the possible permutations of team membership dynamics, task complexity, and internal and external interdependencies. Project teams or work teams certainly vary greatly in work organizations. Such teams are prototypical; real teams must be evaluated on many dimensions to determine the most useful and appropriate performance-appraisal target, type, and data source.

As teams move from the stable, routine, and selfcontained end of the continuum to the dynamic, emergent, and interdependent end, performance--appraisal systems must move from a focus on the outcomes, behaviors, and competencies of teams to those of individuals. At one extreme-the intact work or service team-the focus is on developing better teams. At the other extreme-network teams-the focus is on developing better team members. These members include those who can and will accurately and quickly assess the task and interpersonal idiosyncrasies of their interaction partners at any given moment and adapt their behavioral repertoire to fit the unique needs presented by both.

Effective performance appraisal is a matter of fit between characteristics of the team and the target of assessment, as well as the rating type, source, and purpose. Performance-appraisal systems that result from careful consideration of these contingencies have the greatest probability of being effective-that is, of eliciting employee behavior that contributes to an organization's goals. Allstate Insurance, Xerox, Hewlett-Packard, and many other organizations have demonstrated that a strategic approach to performance-appraisal design dramatically increases the likelihood that team structures will contribute to greater organizational effectiveness.30

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Susanne G. Scott is an assistant professor of management in the Charlton College of Business, University of Massachusetts Dartmouth. She has a Ph.D. from the University of Cincinnati. Her research on team effectiveness, team and organization identity, and leadership has appeared in leading academic journals. She conducts training seminars on leadership stalls, team-based structures, collaboration, and organizational change. Contact:

sscott@umassd.edu.

Walter 0. Einstein is a professor of management in the Charlton College of Business, University of Massachusetts Dartmouth. He has a Ph.D. from Syracuse University. He specializes in management development, and consults and has written extensively on leadership skills and the design of theory-based, practical performance appraisal. Contact: weinstein@umassd.edu.

GEOGRAPHIC NAMES: United States; US

DESCRIPTORS: Studies; Performance appraisal; Teamwork; Management theory
CLASSIFICATION CODES: 9190 (CN=United States); 9130
(CN=Experimental/Theoretical); 6100 (CN=Human resource planning); 2500
(CN=Organizational behavior)
PRINT MEDIA ID: 14316
?

```
### Status: Path 1 of [Dialog Information Services via Modem]

### Status: Initializing TCP/IP using (UseTelnetProto 1 ServiceID pto-dialog)
Trying 31060000009999...Open

DIALOG INFORMATION SERVICES
PLEASE LOGON:
 ******** HHHHHHHH SSSSSSSS?
### Status: Signing onto Dialog
 ********
ENTER PASSWORD:
 ******** HHHHHHHH SSSSSSSS? ********
Welcome to DIALOG
### Status: Connected


Dialog level 02.09.15D

Last logoff:  21oct02 13:02:56
Logon file405 23oct02 08:25:15
           *** ANNOUNCEMENT ***
                    ***
--The following files from Cambridge Scientific Abstracts (CSA)
are no longer available: 14, 28, 32, 33, 36, 37, 41, 44, 56, 61,
76, 77, 108, 117, 232, 238, 269, 293, 335. Please enter HELP CSA
plus the file number to identify alternative sources of information.
Example: HELP CSA14.
                    ***
--File 515 D&B Dun's Electronic Business Directory is now online
completely updated and redesigned. For details, see HELP NEWS 515.
                    ***
--File 990 - NewsRoom now contains May 2002 to present records.
File 993 - NewsRoom archive contains 2002 records from January 2002-
April 2002. To search all 2002 records, BEGIN 990,993 or B NEWS2002.
                    ***
--Alerts have been enhanced to allow a single Alert profile to be
stored and run against multiple files. Duplicate removal is available
across files and for up to 12 months. The Alert may be run according
to the file's update frequency or according to a custom
calendar-based schedule. There are no additional prices for these
enhanced features. See HELP ALERT for more information.
                    ***
--U.S. Patents Fulltext (File 654) has been redesigned with
new search and display features.  See HELP NEWS 654 for
information.
                    ***
--Connect Time joins DialUnits as pricing options on Dialog.
See HELP CONNECT for information.
                    ***
--CLAIMS/US Patents (Files 340,341, 942) have been enhanced
with both application and grant publication level in a
single record. See HELP NEWS 340 for information.
                    ***
--SourceOne patents are now delivered to your email inbox
as PDF replacing TIFF delivery. See HELP SOURCE1 for more
information.
                    ***
--Important news for public and academic
libraries.  See HELP LIBRARY for more information.
                    ***
--Important Notice to Freelance Authors--
See HELP FREELANCE for more information
                    ***
For information about the access to file 43 please see Help News43.
***
NEW FILES RELEASED
***Dialog NewsRoom - Current 3-4 months (File 990)
***Dialog NewsRoom - 2002 Archive (File 993)
```

***Dialog NewsRoom - 2001 Archive (File 994)
***Dialog NewsRoom - 2000 Archive (File 995)
***TRADEMARKSCAN-Finland (File 679)
***TRADEMARKSCAN-Norway (File 678)
***TRADEMARKSCAN-Sweden (File 675)
***
UPDATING RESUMED
***Delphes European Business (File 481)
***
RELOADED
***D&B Dun's Electronic Business Directory (File 515)
***U.S. Patents Fulltext 1976-current (File 654)
***Population Demographics (File 581)
***Kompass Western Europe (File 590)
***D&B - Dun's Market Identifiers (File 516)

REMOVED
***Chicago Tribune (File 632)
***Fort Lauderdale Sun Sentinel (File 497)
***The Orlando Sentinel (File 705)
***Newport News Daily Press (File 747)
***U.S. Patents Fulltext 1980-1989 (File 653)
***Washington Post (File 146)
***Books in Print (File 470)
***Court Filings (File 793)
***Publishers, Distributors & Wholesalers of the U.S. (File 450)
***State Tax Today (File 791)
***Tax Notes Today (File 790)
***Worldwide Tax Daily (File 792)
***ISMEC: Mechanical Engineering Abstracts (File 14)
***Oceanic Abstracts (File 28)
***METADEX: Metals Science (File 32)
***Aluminium Industry Abstracts (File 33)
***Linguistics and Language Behavior Abstracts (File 36)
***Sociological Abstracts (File 37)
***Pollution Abstracts (File 41)
***Aquatic Sciences and Fisheries Abstracts (File 44)
***ARTbibliographies Modern (File 56)
***LISA (Library & Information Science Abstracts) (File 61)
***Life Sciences Collection (File 76)
***Conference Papers Index (File 77)
***Aerospace Database (File 108)
***Water Resources Abstracts (File 117)
***Applied Social Sciences Index and Abstracts (File 232)
***Abstracts in New Technologies and Engineering (File 238)
***Materials Business File (File 269)
***Engineered Materials Abstracts (File 293)
***Ceramic Abstracts (File 335)

New document supplier
IMED has been changed to INFOTRIE (see HELP OINFOTRI)

>>> Enter BEGIN HOMEBASE for Dialog Announcements <<<
>>> of new databases, price changes, etc. <<<
****
COREFULL is set ON as an alias for 15,9,623,810,275,624,636,621,813,16,160,148,20.
COREABS is set ON as an alias for 77,35,593,65,2,233,99,473,474,475.
COREALL is set ON as an alias for COREFULL,COREABS.
SOFTFULL is set ON as an alias for 278,634,256.
EUROFULL is set ON as an alias for 348,349.
JAPOABS is set ON as an alias for 347.
HEALTHFULL is set ON as an alias for 442,149,43,444.
HEALTHABS is set ON as an alias for 5,73,151,155,34,434.
DRUGFULL is set ON as an alias for 455,129,130.
DRUGABS is set ON as an alias for 74,42.
INSURANCEFULL is set ON as an alias for 625,637.
INSURANCEABS is set ON as an alias for 169.
TRANSPORTFULL is set ON as an alias for 80,637.

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TRANSPORTABS is set ON as an alias for 108,6,63.
ADVERTISINGFULL is set ON as an alias for 635,570,PAPERSMJ,PAPERSEU.
INVENTORYABS is set ON as an alias for 8,14,94,6,34,434,7.
BANKINGFULL is set ON as an alias for 625,268,626,267.
BANKINGABS is set ON as an alias for 139.
HEALTHALL is set ON as an alias for COREFULL,COREABS,HEALTHFULL,HEALTHABS.
INSURANCEALL is set ON as an alias for COREFULL,COREABS,INSURANCEFULL,INSURANCEABS.
RESERVATIONALL is set ON as an alias for COREFULL, COREABS.
OPERATIONSALL is set ON as an alias for COREFULL,COREABS,INVENTORYABS.
TRANSPORTALL is set ON as an alias for COREFULL,COREABS,TRANSPORTFULL,TRANSPORTABS.
ADVERTISINGALL is set ON as an alias for COREFULL,COREABS,ADVERTISINGFULL.
SHOPPINGALL is set ON as an alias for COREFULL,COREABS,ADVERTISINGALL,47.
INVENTORYALL is set ON as an alias for COREFULL,COREABS,INVENTORYFULL.
BANKINGALL is set ON as an alias for COREFULL,COREABS,BANKINGFULL,BANKINGABS.
PORTFOLIOALL is set ON as an alias for COREFULL,COREABS,BANKINGALL.
TRADINGALL is set ON as an alias for COREFULL,COREABS,BANKINGALL.
CREDITALL is set ON as an alias for COREFULL,COREABS,BANKINGALL.
FUNDSALL is set ON as an alias for COREFULL,COREABS,BANKINGALL,608.
*                       *
SYSTEM:HOME
Cost is in DialUnits
Menu System II: D2 version 1.7.8 term=ASCII
                    *** DIALOG HOMEBASE(SM) Main Menu ***

 Information:
  1.  Announcements (new files, reloads, etc.)
  2.  Database, Rates, & Command Descriptions
  3.  Help in Choosing Databases for Your Topic
  4.  Customer Services (telephone assistance, training, seminars, etc.)
  5.  Product Descriptions

 Connections:
  6.  DIALOG(R) Document Delivery
  7.  Data Star(R)

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      /H = Help            /L = Logoff          /NOMENU = Command Mode


Enter an option number to view information or to connect to an online
 service.  Enter a BEGIN command plus a file number to search a database
(e.g., B1 for ERIC).
?b coreabs, corefull

>>>          77 does not exist
>>>1 of the specified files is not available
       23oct02 08:25:33 User242933 Session D119.1
             $0.00    0.185 DialUnits FileHomeBase
     $0.00  Estimated cost FileHomeBase
     $0.07  TELNET
     $0.07  Estimated cost this search
     $0.07  Estimated total session cost   0.185 DialUnits


SYSTEM:OS  - DIALOG OneSearch
  File  35:Dissertation Abs Online  1861-2002/Sep
        (c) 2002 ProQuest Info&Learning
  File 593:KOMPASS Central/Eastern Europe  2002/Jun
        (c) 2002 KOMPASS Intl.
  File  65:Inside Conferences  1993-2002/Oct W3
        (c) 2002 BLDSC all rts. reserv.
  File   2:INSPEC  1969-2002/Oct W3
        (c) 2002 Institution of Electrical Engineers
*File   2: Alert feature enhanced for multiple files, duplicates
removal, customized scheduling. See HELP ALERT.
  File 233:Internet & Personal Comp. Abs.  1981-2002/Oct
        (c) 2002 Info. Today Inc.
  File  99:Wilson Appl. Sci & Tech Abs  1983-2002/Sep
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          (c) 2002 The HW Wilson Co.
  File 473:FINANCIAL TIMES ABSTRACTS  1998-2001/APR 02
          (c) 2001 THE NEW YORK TIMES
*File 473: This file will not update after March 31, 2001.
It will remain on Dialog as a closed file.
  File 474:New York Times Abs  1969-2002/Oct 22
          (c) 2002 The New York Times
  File 475:Wall Street Journal Abs  1973-2002/Oct 21
          (c) 2002 The New York Times
  File  15:ABI/Inform(R)  1971-2002/Oct 22
          (c) 2002 ProQuest Info&Learning
*File  15: Alert feature enhanced for multiple files, duplicate
removal, customized scheduling. See HELP ALERT.
  File   9:Business & Industry(R)  Jul/1994-2002/Oct 22
          (c) 2002 Resp. DB Svcs.
  File 623:Business Week  1985-2002/Oct 22
          (c) 2002 The McGraw-Hill Companies Inc
  File 810:Business Wire  1986-1999/Feb 28
          (c) 1999 Business Wire
  File 275:Gale Group Computer DB(TM)  1983-2002/Oct 23
          (c) 2002 The Gale Group
  File 624:McGraw-Hill Publications  1985-2002/Oct 22
          (c) 2002 McGraw-Hill Co. Inc
  File 636:Gale Group Newsletter DB(TM)  1987-2002/Oct 23
          (c) 2002 The Gale Group
  File 621:Gale Group New Prod.Annou.(R)  1985-2002/Oct 22
          (c) 2002 The Gale Group
  File 813:PR Newswire  1987-1999/Apr 30
          (c) 1999 PR Newswire Association Inc
  File  16:Gale Group PROMT(R)  1990-2002/Oct 23
          (c) 2002 The Gale Group
*File  16: Alert feature enhanced for multiple files, duplicate
removal, customized scheduling. See HELP ALERT.
  File 160:Gale Group PROMT(R)  1972-1989
          (c) 1999 The Gale Group
  File 148:Gale Group Trade & Industry DB  1976-2002/Oct 23
          (c)2002 The Gale Group
*File 148: Alert feature enhanced for multiple files, duplicate
removal, customized scheduling. See HELP ALERT.
  File  20:Dialog Global Reporter  1997-2002/Oct 23
          (c) 2002 The Dialog Corp.

      Set  Items  Description
      ---  -----  -----------
?s maynard and operation and sequence
           51082  MAYNARD
         3239190  OPERATION
          371075  SEQUENCE
      S1     213  MAYNARD AND OPERATION AND SEQUENCE
?s s1 and time and measurement
             213  S1
        15232043  TIME
         1054126  MEASUREMENT
      S2      65  S1 AND TIME AND MEASUREMENT
?s s2 and (time (w) measurement)
Processing
Processed  20 of  22 files ...
Completed processing all files
             65  S2
        15232043  TIME
         1054126  MEASUREMENT
            9116  TIME(W)MEASUREMENT
      S3      16  S2 AND (TIME (W) MEASUREMENT)
?type s3/3,av/all
>>>No matching display code(s) found in file(s): 9, 16, 20, 35, 65, 99,
   160, 233, 473-475, 593, 621, 623-624, 636, 810, 813

 3/3,AV/1     (Item 1 from file: 35)
DIALOG(R)File  35:Dissertation Abs Online
```

01819674 ORDER NO: AADAA-I3005122
An integration of time measurement **method and ergonomic knowledge into the generation of assembly planning**
Author: Zhou, Jiannan
Degree: Ph.D.
Year: 2001
Corporate Source/Institution: The University of Utah (0240)
Source: VOLUME 62/02-B OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 1047. 119 PAGES
ISBN: 0-493-14181-2

3/3,AV/2 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

03766434 INSPEC Abstract Number: C91004987
Title: Computerized predetermined motion- time **systems in manufacturing industries**
Author(s): Genaidy, A.M.; Agrawal, A.; Mital, A.
Author Affiliation: Dept. of Mech., Ind. & Nucl. Eng., Cincinnati Univ, OH, USA
Journal: Computers & Industrial Engineering vol.18, no.4 p.571-84
Publication Date: 1990 Country of Publication: UK
CODEN: CINDDL ISSN: 0360-8352
U.S. Copyright Clearance Center Code: 0360-8352/90/$3.00+0.00
Language: English
Subfile: C

3/3,AV/3 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

03548395 INSPEC Abstract Number: C90015719
Title: A comparison of computerized predetermined time **systems**
Author(s): Wygant, R.M.
Author Affiliation: Dept. of Ind. Eng., Western Michigan Univ., Kalamazoo, MI, USA
Journal: Computers & Industrial Engineering vol.17 p.480-5
Publication Date: 1989 Country of Publication: UK
CODEN: CINDDL ISSN: 0360-8352
U.S. Copyright Clearance Center Code: 0360-8352/89/$3.00+0.00
Conference Title: 11th Annual Conference on Computers and Industrial Engineering
Conference Date: 15-17 March 1989 Conference Location: Orlando, FL, USA
Language: English
Subfile: C

3/3,AV/4 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

03360427 INSPEC Abstract Number: B89028596
Title: T&D work measurement **-setting and maintaining a standard**
Author(s): Stahlheber, W.L.
Author Affiliation: Oklahoma Gas & Electric Co., Oklahoma City, OK, USA
Journal: Transmission and Distribution vol.40, no.12 p.20-2, 25
Publication Date: Dec. 1988 Country of Publication: USA
CODEN: TRDIAT ISSN: 0041-1280
Language: English
Subfile: B

3/3,AV/5 (Item 1 from file: 15)

DIALOG(R)File 15:ABI/Inform(R)

02053355 45994463
Measuring maintenance
Westerkamp, Thomas A
IIE Solutions v31n10 PP: 32-35 Oct 1999 ISSN: 1085-1259 JRNL CODE: INE
WORD COUNT: 2984

PRINT MEDIA ID: 23999

3/3,AV/6 (Item 2 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01433246 00-84233
Standard data: Developing an effective predetermined time **system**
Kilgore, James T
IIE Solutions v29n6 PP: 40-42 Jun 1997 ISSN: 1085-1259 JRNL CODE: INE
WORD COUNT: 2235

3/3,AV/7 (Item 3 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01017937 96-67330
Work-measured labor standards - The state of the art
Dossett, Royal J
Industrial Engineering v27n4 PP: 21-25 Apr 1995 ISSN: 0019-8234
JRNL CODE: INE
WORD COUNT: 2202

3/3,AV/8 (Item 4 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00737052 93-86273
Using work design techniques and method engineering to enhance productivity
Al-Dohaim, Yasser A; Naqvi, Syed Abid Ali
Industrial Engineering v25n7 PP: 58-60 Jul 1993 ISSN: 0019-8234
JRNL CODE: INE
WORD COUNT: 1906

3/3,AV/9 (Item 5 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00529016 91-03360
Computerized Predetermined Motion- Time **Systems in Manufacturing Industries**
Genaidy, A. M.; Agrawal, A.; Mital, A.
Computers & Industrial Engineering v18n4 PP: 571-584 1990 ISSN: 0360-8352 JRNL CODE: CIE

3/3,AV/10 (Item 6 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00502763 90-28520
Comparison of Labour Standards for a Greenhouse Tomato Production System: A Case Study
Luxhoj, James T.; Giacomelli, Gene A.
International Journal of Operations & Production Management v10n3 PP: 38-49 1990 ISSN: 0144-3577 JRNL CODE: IJO

3/3,AV/11 (Item 7 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00480055 90-05812
A Comparison of Computerized Predetermined Time **Systems**
Wygant, Robert M.
Computers & Industrial Engineering v17n1-4 PP: 480-485 1989 ISSN: 0360-8352 JRNL CODE: CIE

3/3,AV/12 (Item 8 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00057049 77-09427
MOST SYSTEMS FOR WORK MEASUREMENT
ZANDIN, KJELL B.; WEISS, ROGER M.
INDUSTRIAL ENGINEERING V9 N6 PP: 43-45 JUNE 1977 ISSN: 0019-8234
JRNL CODE: INE

3/3,AV/13 (Item 1 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

01620043 SUPPLIER NUMBER: 14428403 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Using work design techniques and method engineering to enhance productivity. (includes bibliography)
Al-Dohaim, Yasser A.; Naqvi, Syed Abid Ali
Industrial Engineering, v25, n7, p58(3)
July, 1993
ISSN: 0019-8234 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 1958 LINE COUNT: 00150

3/3,AV/14 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

11767991 SUPPLIER NUMBER: 57796508 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Standard data: developing an effective predetermined time **system.**
Kilgore, James T.
IIE Solutions, 29, 6, 40(3)
June, 1997
ISSN: 1085-1259 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 2380 LINE COUNT: 00207

3/3,AV/15 (Item 2 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

09827576 SUPPLIER NUMBER: 16889145 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Work-measured labor standards: the state of the art. (includes related article)(Work Measurement **: A Series of 3 Articles)(Cover Story)**
Dossett, Royal J.
Industrial Engineering, v27, n4, p21(5)
April, 1995
DOCUMENT TYPE: Cover Story ISSN: 0019-8234 LANGUAGE: English
RECORD TYPE: Fulltext; Abstract
WORD COUNT: 2389 LINE COUNT: 00191

3/3,AV/16 (Item 3 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

06717318 SUPPLIER NUMBER: 14428403 (USE FORMAT 7 OR 9 FOR FULL TEXT)

Using work design techniques and method engineering to enhance productivity. (includes bibliography)

Al-Dohaim, Yasser A.; Naqvi, Syed Abid Ali

Industrial Engineering, v25, n7, p58(3)
July, 1993
ISSN: 0019-8234 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 1958 LINE COUNT: 00150

?

?s s3 and (maynard (w) operation)
16 S3
51082 MAYNARD
3239190 OPERATION
32 MAYNARD(W)OPERATION
S4 11 S3 AND (MAYNARD (W) OPERATION)
?type s4/3,ab/all
>>>No matching display code(s) found in file(s): 65, 593, 623-624, 810, 813

Considered abstracts D

4/3,AB/1 (Item 1 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online

01819674 AADAAI3005122
An integration of time measurement **method and ergonomic knowledge into the generation of assembly planning**
Author: Zhou, Jiannan
Degree: Ph.D.
Year: 2001
Corporate Source/Institution: The University of Utah (0240)
Source: VOLUME 62/02-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 1047. 119 PAGES
ISBN: 0-493-14181-2

Assembly planning, in which parts and subassemblies are put together, may significantly affect the efficiency of the assembly process and safety conditions for the assemblers. Although many experienced industrial engineers are proficient at devising efficient ways to assemble a given product, systematic procedures integrating the **time measurement** formula and compiled ergonomic knowledge are needed to facilitate automated design procedures and to guarantee that better and ergonomically safer assembly planning options have not been overlooked.

The three-step approach, (1) establishment of precedence constraints, (2) automatic generation of all valid assembly sequences and (3) refinement and selection of the most efficient and safe assembly **sequence** , is a general and applicable strategy to assembly operations. The ability to input constraints and task descriptions, generate all valid assembly sequences, report the corresponding assembly efficiency and perform ergonomic hazard level analyses provides a way to select and refine a more efficient and ergonomically suitable assembly plan in concurrent design.

This dissertation presents the conceptual structure of a strategy which integrates (1) the constraints method of automatically generating all valid assembly sequences, (2) MOST (**Maynard Operation Sequence** Technique), a **time measurement** method and task description and (3) compiled ergonomic knowledge base, into refining and selecting more efficient and ergonomically safer assembly planning in the manual assembly environment. Based on this conceptual structure, two computational systems have been developed for generating more efficient and ergonomic safer assembly plan under the MOST criteria.

The first system investigates the approach of generating more efficient assembly planning based on the constraint conditions and MOST **time measurement** criteria. The second system was designed to analyze assembly task descriptions under the MOST criteria to predict the ergonomic suitability level by applying compiled ergonomic knowledge.

The pathway and description for resolving, refining and selecting assembly sequences and establishing the process task which can be analyzed for ergonomic suitability are applicable to both the design and manufacturing aspects of a project. Based on this close relationship between the product and process, the design iterations and interaction with manufacturing should be faster and more frequent.

4/3,AB/2 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

03766434 INSPEC Abstract Number: C91004987
Title: Computerized predetermined motion- time **systems in manufacturing industries**

Author(s): Genaidy, A.M.; Agrawal, A.; Mital, A.
Author Affiliation: Dept. of Mech., Ind. & Nucl. Eng., Cincinnati Univ, OH, USA
Journal: Computers & Industrial Engineering vol.18, no.4 p.571-84
Publication Date: 1990 Country of Publication: UK
CODEN: CINDDL ISSN: 0360-8352
U.S. Copyright Clearance Center Code: 0360-8352/90/$3.00+0.00
Language: English
Abstract: In recent years, a number of computerized work **measurement** systems have been developed. In particular, attempts have been made to computerize the manual versions of existing predetermined motion- **time** systems (PMTS). This can be attributed to the spread of computer technology in the last decade which may further the application of PMTS in manufacturing industries in terms of speed, ease of use, and minimization of degree of judgement on the part of the analyst in establishing **time** standards. The main objective of the paper is to survey the various computerized PMTS. In particular the authors examine the computerized systems of methods- **Time measurement** (MTM), modular arrangement of predetermined **time** standards (MODAPTS), and **Maynard operation sequence** technique (MOST) due to their popular and worldwide support. The background and computer application of the aforementioned systems are discussed. Furthermore, comparative examples are given to illustrate the advantages and limitations of each system.
Subfile: C

4/3,AB/3 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

03548395 INSPEC Abstract Number: C90015719
Title: A comparison of computerized predetermined time **systems**
Author(s): Wygant, R.M.
Author Affiliation: Dept. of Ind. Eng., Western Michigan Univ., Kalamazoo, MI, USA
Journal: Computers & Industrial Engineering vol.17 p.480-5
Publication Date: 1989 Country of Publication: UK
CODEN: CINDDL ISSN: 0360-8352
U.S. Copyright Clearance Center Code: 0360-8352/89/$3.00+0.00
Conference Title: 11th Annual Conference on Computers and Industrial Engineering
Conference Date: 15-17 March 1989 Conference Location: Orlando, FL, USA
Language: English
Abstract: With the increased availability and use of personal computers by industrial engineers, most of the widely used predetermined **time** systems are now being offered with computerized versions to assist in analysis and documentation. The paper compares three different systems: methods **time measurement** (MTM), **Maynard operation sequence** technique (MOST), and modular arrangement of predetermined **time** standards (MODAPTS).
Subfile: C

4/3,AB/4 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

03360427 INSPEC Abstract Number: B89028596
Title: T&D work measurement **-setting and maintaining a standard**
Author(s): Stahlheber, W.L.
Author Affiliation: Oklahoma Gas & Electric Co., Oklahoma City, OK, USA
Journal: Transmission and Distribution vol.40, no.12 p.20-2, 25
Publication Date: Dec. 1988 Country of Publication: USA
CODEN: TRDIAT ISSN: 0041-1280
Language: English
Abstract: In 1978, Oklahoma Gas and Electric Company (OG&E) started measuring the work of its overhead and underground distribution crews. **Measurement** of transmission and construction departments was initiated in

1979 and system laboratory and tree trimming followed in 1981. The approach used for each of the work- **measurement** programs was to assign supervisors or craftsmen to become planner/analysts (PAs). These people were responsible for developing **time** standards and for administering the program following implementation. The PAs were trained in three predetermined **time** techniques: methods- **time** - **measurement** (MTM); universal-standard-data (USD); and **Maynard operation sequence** technique (MOST). The author discusses how these techniques were used to calculate the **time** standards.
Subfile: B

4/3,AB/5 (Item 1 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

02053355 45994463
Measuring maintenance
Westerkamp, Thomas A
IIE Solutions v31n10 PP: 32-35 Oct 1999 ISSN: 1085-1259 JRNL CODE: INE
WORD COUNT: 2984

ABSTRACT: When physical plant value, maintenance labor, materials, and overhead are considered, maintenance is the largest single variable operating cost in most enterprises. Yet maintenance does not receive a proportionate amount of management attention. It is revealed that the industrial engineer can spearhead dramatic productivity improvement by implementing work **measurement** to manage and control maintenance. An examination of the nature of maintenance work reveals its unique characteristics. It is low-volume work. A maintenance technician often does many different jobs in a single day, unlike production personnel, who do high-volume work. Universal maintenance standards can be used everywhere maintenance work is performed - manufacturing, service, government, utilities, commerce, finance, education, and health care. They can be applied to conventional building and equipment maintenance as well as to the huge and rapidly growing information technology assets of an enterprise.

4/3,AB/6 (Item 2 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01017937 96-67330
Work-measured labor standards - The state of the art
Dossett, Royal J
Industrial Engineering v27n4 PP: 21-25 Apr 1995 ISSN: 0019-8234
JRNL CODE: INE
WORD COUNT: 2202

ABSTRACT: Work-measured labor standards are useful tools applicable to many areas of business. Manufacturers generally have a bill-of-materials system to determine standard parts cost, but they do not have an equivalent bill-of-labor system to determine standard labor costs. Basically, manufacturers need to formalize their labor times, and their labor costs. If the standard labor times are realistic, costing is more accurate, and delivery times are also more accurate. Five techniques are commonly used to develop standard times: 1. motion analysis, 2. **time** study, 3. activity sampling, 4. historical data, and 5. estimates. Since nearly all manufacturers are already using standard times in one form or another, using work **measurement** to develop these items is simply an improvement on what they are already doing.

4/3,AB/7 (Item 3 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00529016 91-03360
Computerized Predetermined Motion- Time Systems in Manufacturing Industries
Genaidy, A. M.; Agrawal, A.; Mital, A.
Computers & Industrial Engineering v18n4 PP: 571-584 1990 ISSN: 0360-8352 JRNL CODE: CIE

ABSTRACT: In recent years, a number of computerized work **measurement** systems have been developed. In particular, attempts have been made to computerize the manual versions of existing predetermined motion- **time** systems (PMTS). This can be attributed to the spread of computer technology in the last decade, which may further the application of PMTSs in manufacturing industries in terms of speed, ease of use, and minimization of degree of judgment on the part of the analyst in establishing **time** standards. Various computerized PMTSs are surveyed, with particular attention given to the computerized systems of methods- **time measurement** (MTM), modular arrangement of predetermined **time** standards (MODAPTS), and **Maynard Operation Sequence** Technique (MOST). Comparative examples are given to illustrate the advantages and limitations of each system. One of the major advantages of MODAPTS Plus Professional over other computerized PMTSs is the ability to compute source of recovery for various physical tasks. While the MOST system is easy to learn, it is unable to specify factors for weight considerations.

4/3,AB/8 (Item 4 from file: 15)

00502763 90-28520
Comparison of Labour Standards for a Greenhouse Tomato Production System: A Case Study
Luxhoj, James T.; Giacomelli, Gene A.
International Journal of Operations & Production Management v10n3 PP: 38-49 1990 ISSN: 0144-3577 JRNL CODE: IJO

ABSTRACT: The formulation of labor standards for the single truss tomato production system was examined at the New Jersey Agricultural Experimental Station at Rutgers University. Both **time** study and predetermined **time** systems, such as the Element Times for Agriculture tables and the **Maynard Operation Sequence** Technique tables, were used to determine standards for pruning and harvesting in a single truss tomato production system. It was hypothesized that a predetermined **time** system could be used to establish greenhouse labor standards, thus replacing the costly process of direct **time** study. Results indicate that, although the predetermined **time** values differed from measured **time** study by 6.12% to 23% for pruning, the variation for harvesting ranged from 2.82% to 6.82%. Combined results indicate that predetermined **time** systems can be used effectively to establish greenhouse labor standards for short cycle tasks without significant loss of accuracy when using an absolute scale.

4/3,AB/9 (Item 5 from file: 15)

00480055 90-05812
A Comparison of Computerized Predetermined Time Systems
Wygant, Robert M.
Computers & Industrial Engineering v17n1-4 PP: 480-485 1989 ISSN: 0360-8352 JRNL CODE: CIE

ABSTRACT: With the increased availability of personal computers and their use by industrial engineers, most widely used predetermined **time** systems are now being offered with computerized versions to assist in analysis and documentation. Three different systems - Methods **Time Measurement** (MTM), **Maynard Operation Sequence** Technique (MOST), and Modular Arrangement of Predetermined **Time** Standards (MODAPTS) - are compared. The

4M implementation of MTM provides more options than the original ADAM version. Computerized MOST provides a work area layout that helps to document the method and is useful when a layout is changed or an alternate workplace design is to be evaluated. While MODAPTS PLUS lacks the data handling capabilities of either 4M or MOST, it is easy to learn and can analyze heavy physical work. All 3 of the systems have been integrated with the computerized standard data system FAST.

4/3,AB/10 (Item 6 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00057049 77-09427
MOST SYSTEMS FOR WORK MEASUREMENT
ZANDIN, KJELL B.; WEISS, ROGER M.
INDUSTRIAL ENGINEERING V9 N6 PP: 43-45 JUNE 1977 ISSN: 0019-8234
JRNL CODE: INE

ABSTRACT: THE NEWEST OF THE MTM (METHODS **TIME MEASUREMENT**) SYSTEMS IS MOST (**MAYNARD OPERATION SEQUENCE** TECHNIQUE). ANALYSIS OF MTM PATTERNS REVEALED THAT CERTAIN MOTION SEQUENCES IN MANUAL WORK ARE REPEATED CONSISTENTLY. BY FURTHER RESEARCH AND EXPERIMENTS, THESE SEQUENCES WERE MODIFIED AND REDUCED IN NUMBER TO FORM THE BASIS OF THE MOST SYSTEM. THE ADVANTAGE OF MOST IS NOT THAT IT CAN REPLACE MTM IN ALL APPLICATIONS, BUT RATHER THAT IT CAN BE APPLIED TO WORK FOR WHICH THE OLDER SYSTEMS ARE UNSUITED. IE'S WHO ARE USING MOST REPORT A NUMBER OF POSITIVE RESULTS - 1. THEY CAN WORK FASTER. 2. PROSPECTIVE SETUPS CAN BE ESTIMATED RAPIDLY AND ACCURATELY. 3. THE SIMPLICITY OF MOST MAKES IT EASY TO GRASP. 4. MOST CUTS DOWN VARIATIONS BETWEEN ANALYSTS. 5. MOST IS EASY TO LEARN. 6. PREVIOUSLY UNRATABLE JOBS CAN NOW BE RATED. SAMPLE CHARTS.

4/3,AB/11 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

09827576 SUPPLIER NUMBER: 16889145 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Work-measured labor standards: the state of the art. (includes related article)(Work Measurement **: A Series of 3 Articles)(Cover Story)**
Dossett, Royal J.
Industrial Engineering, v27, n4, p21(5)
April, 1995
DOCUMENT TYPE: Cover Story ISSN: 0019-8234 LANGUAGE: English
RECORD TYPE: Fulltext; Abstract
WORD COUNT: 2389 LINE COUNT: 00191

ABSTRACT: Work-measured labor standards have long been used by companies in identifying solutions to labor productivity problems. Businesses will find it very useful to design a bill-of-labor system for measuring standard labor costs in the same way that bill-of-materials are designed to determine the standard cost of parts. Creating a bill-of-labor system requires formalizing a company's labor times and labor costs. Realistic labor times result in more accurate costing and delivery times. Standard times can be created by using any of five techniques. Motion analysis is best for studying very short and repetitive taks, **time** study applies best to short and repetitive tasks, while activity sampling is ideal for longer, variable tasks. Historical data is well suited for long, repetitive and variable tasks, while estimates is good for infrequently performed, variable tasks. Tips for maintaining standard times are offered.
?

Status: Path 1 of [Dialog Information Services via Modem]

Status: Initializing TCP/IP using (UseTelnetProto 1 ServiceID pto-dialog)
Trying 3106900061...Open

DIALOG INFORMATION SERVICES
PLEASE LOGON:
 ******** HHHHHHHH SSSSSSSS?
Status: Signing onto Dialog
 ****
ENTER PASSWORD:
 ******** HHHHHHHH SSSSSSSS? ********
Welcome to DIALOG
Status: Connected

Dialog level 01.10.01D

Last logoff: 23oct01 12:56:33
Logon file405 24oct01 13:49:28
           *** ANNOUNCEMENT ***
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--Important Notice to Freelance Authors--
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***Mergent Company Snapshots (File 556)
***Mergent Company News Reports (File 557)
***Financial Times Fulltext (File 476)

***TRADEMARKSCAN-Japan (File 669)

UPDATING RESUMED
***Delphes European Business (File 481)
***Books In Print (File 470)
                           ***
RELOADED
***CLAIMS/US PATENTS (Files 340, 341, 942)
***Kompass Middle East/Africa/Mediterranean (File 585)
***Kompass Asia/Pacific (File 592)
***Kompass Central/Eastern Europe (File 593)
***Kompass Canada (File 594)
***CANCERLIT (File 159)
***Information Science Abstracts (File 202)

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                  ****
COREFULL is set ON as an alias for 15,9,623,810,275,624,636,621,813,16,160,148,20.
COREABS is set ON as an alias for 77,35,593,65,2,233,99,473,474,475.
COREALL is set ON as an alias for COREFULL,COREABS.

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SOFTFULL is set ON as an alias for 278,634,256.
EUROFULL is set ON as an alias for 348,349.
JAPOABS is set ON as an alias for 347.
HEALTHFULL is set ON as an alias for 442,149,43,444.
HEALTHABS is set ON as an alias for 5,73,151,155,34,434.
DRUGFULL is set ON as an alias for 455,129,130.
DRUGABS is set ON as an alias for 74,42.
INSURANCEFULL is set ON as an alias for 625,637.
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TRANSPORTABS is set ON as an alias for 108,6,63.
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BANKINGFULL is set ON as an alias for 625,268,626,267.
BANKINGABS is set ON as an alias for 139.
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OPERATIONSALL is set ON as an alias for COREFULL,COREABS,INVENTORYABS.
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BANKINGALL is set ON as an alias for COREFULL,COREABS,BANKINGFULL,BANKINGABS.
PORTFOLIOALL is set ON as an alias for COREFULL,COREABS,BANKINGALL.
TRADINGALL is set ON as an alias for COREFULL,COREABS,BANKINGALL.
CREDITALL is set ON as an alias for COREFULL,COREABS,BANKINGALL.
FUNDSALL is set ON as an alias for COREFULL,COREABS,BANKINGALL,608.
.
SYSTEM:HOME
Cost is in DialUnits
Menu System II: D2 version 1.7.8 term=ASCII
                    *** DIALOG HOMEBASE(SM) Main Menu ***

 Information:
  1.  Announcements (new files, reloads, etc.)
  2.  Database, Rates, & Command Descriptions
  3.  Help in Choosing Databases for Your Topic
  4.  Customer Services (telephone assistance, training, seminars, etc.)
  5.  Product Descriptions

 Connections:
  6.  DIALOG(R) Document Delivery
  7.  Data Star(R)

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      /H = Help            /L = Logoff          /NOMENU = Command Mode


Enter an option number to view information or to connect to an online
 service.  Enter a BEGIN command plus a file number to search a database
(e.g., B1 for ERIC).
?b coreabs corefull

       24oct01 13:49:44 User242933 Session D69.1
            $0.00    0.231 DialUnits FileHomeBase
     $0.00  Estimated cost FileHomeBase
     $0.01  TYMNET
     $0.01  Estimated cost this search
     $0.01  Estimated total session cost   0.231 DialUnits


SYSTEM:OS  - DIALOG OneSearch
  File  77:Conference Papers Index  1973-2001/Sep
        (c) 2001 Cambridge Sci Abs
  File  35:Dissertation Abs Online  1861-2001/Oct
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(c) 2001 ProQuest Info&Learning
File 593:KOMPASS Central/Eastern Europe 2001/Sep
(c) 2001 KOMPASS Intl.
File 65:Inside Conferences 1993-2001/Oct W3
(c) 2001 BLDSC all rts. reserv.
***File 65: For variance in UDs please see Help News65.**
File 2:INSPEC 1969-2001/Oct W3
(c) 2001 Institution of Electrical Engineers
File 233:Internet & Personal Comp. Abs. 1981-2001/Oct
(c) 2001 Info. Today Inc.
File 99:Wilson Appl. Sci & Tech Abs 1983-2001/Sep
(c) 2001 The HW Wilson Co.
File 473:FINANCIAL TIMES ABSTRACTS 1998-2001/APR 02
(c) 2001 THE NEW YORK TIMES
***File 473: This file will not update after March 31, 2001.**
It will remain on Dialog as a closed file.
File 474:New York Times Abs 1969-2001/Oct 23
(c) 2001 The New York Times
File 475:Wall Street Journal Abs 1973-2001/Oct 23
(c) 2001 The New York Times
File 15:ABI/Inform(R) 1971-2001/Oct 24
(c) 2001 ProQuest Info&Learning
File 9:Business & Industry(R) Jul/1994-2001/Oct 23
(c) 2001 Resp. DB Svcs.
File 623:Business Week 1985-2001/Oct W2
(c) 2001 The McGraw-Hill Companies Inc
File 810:Business Wire 1986-1999/Feb 28
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File 275:Gale Group Computer DB(TM) 1983-2001/Oct 22
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File 624:McGraw-Hill Publications 1985-2001/Oct 23
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File 636:Gale Group Newsletter DB(TM) 1987-2001/Oct 23
(c) 2001 The Gale Group
File 621:Gale Group New Prod.Annou.(R) 1985-2001/Oct 23
(c) 2001 The Gale Group
File 813:PR Newswire 1987-1999/Apr 30
(c) 1999 PR Newswire Association Inc
File 16:Gale Group PROMT(R) 1990-2001/Oct 23
(c) 2001 The Gale Group
File 160:Gale Group PROMT(R) 1972-1989
(c) 1999 The Gale Group
File 148:Gale Group Trade & Industry DB 1976-2001/Oct 23
(c)2001 The Gale Group
File 20:World Reporter 1997-2001/Oct 24
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Set	Items	Description

?s information and executives and need and service and knowledge and work and costs
Processing
Processed 10 of 23 files ...
Processing
Processing
Processed 20 of 23 files ...
Processing
Processing
Completed processing all files

	15020749	INFORMATION
	1435046	EXECUTIVES
	5298919	NEED
	10123034	SERVICE
	1455111	KNOWLEDGE
	6866582	WORK
	4463668	COSTS
S1	11686	INFORMATION AND EXECUTIVES AND NEED AND SERVICE AND KNOWLEDGE AND WORK AND COSTS

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?2 and (service (w) work)
>>>Unrecognizable Command
?s 2 and (service (w) work)
Processed  10 of  23 files ...
Processing
Processing
Processed  20 of  23 files ...
Processing
Completed processing all files
        16134172  2
        10123034  SERVICE
         6866582  WORK
            8208  SERVICE(W)WORK
      S2    3368  2 AND (SERVICE (W) WORK)
?s s2 and (knowledge (w) based)
Processing
Processed  20 of  23 files ...
Completed processing all files
            3368  S2
         1455111  KNOWLEDGE
        12842152  BASED
           79265  KNOWLEDGE(W)BASED
      S3      22  S2 AND (KNOWLEDGE (W) BASED)
?type s3/3,ab/all
>>>No matching display code(s) found in file(s): 65, 593, 623-624, 810, 813
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3/3,AB/1 (Item 1 from file: 15)

DIALOG(R)File 15:ABI/Inform(R)

02181929 74207999

Strategic performance appraisal in team-based organizations: One size does not fit all

Scott, Susanne G; Einstein, Walter O

Academy of Management Executive v15n2 PP: 107-116 May 2001 ISSN: 1079-5545 JRNL CODE: AEX
WORD COUNT: 6106

ABSTRACT: The pervasive use of teams in today's organizations makes employee performance appraisal more challenging than in the past. Unfortunately, prescriptions offered in the business press often fail to consider the diversity of team forms used in team-based organizations. This article identifies 3 team types and examines the fit between performance-appraisal characteristics and team types. Performance-appraisal characteristics include target, type, and data source. The analysis underscores the critical need for effective leadership in designing and implementing performance appraisal systems in team-based organizations.

3/3,AB/2 (Item 2 from file: 15)

DIALOG(R)File 15:ABI/Inform(R)

01853058 05-04050

Crossing the high-tech divide

Suro, Robert

American Demographics v21n7 PP: 54-60 Jul 1999 ISSN: 0163-4089
JRNL CODE: ADE
WORD COUNT: 3625

ABSTRACT: A new immigrant class is taking root in the suburbs of the nation's capital. Drawn by the growth of Washington's technology corridors that has characterized the '90s boom, many newcomers lack the education and language skills necessary to advance into the information age. The result is a starkly divided landscape of high-tech haves and low-wage have-nots. Statistics are provided on workforce occupations of recent immigrants,

major occupations of the workforce overall, compared to recent immigrants, major countries of origin for legal immigrants to Washington, D. C., and major characteristics of Fairfax County, Virginia, residents, long-term and recently arrived from abroad.

3/3,AB/3 (Item 3 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01721863 03-72853
Real strategies for virtual organizing
Venkatraman, N; Henderson, John C
Sloan Management Review v40n1 PP: 33-48 Fall 1998 ISSN: 0019-848X
JRNL CODE: SMZ
WORD COUNT: 9904

ABSTRACT: Current models of organizational strategy and structure fail to meet the challenges of the information age. Based on a field study, an architecture for virtual organizing is developed that focuses on the importance of knowledge and intellect in creating value. Information technology lies at the heart of this business model for the next century. This approach incorporates 3 interdependent vectors: 1. customer interaction, **2** . asset configuration, and 3. knowledge leverage. Each of the 3 vectors has 3 stages, and each vector raises a distinct series of questions for managers. The overall challenge for companies is to harmonize the 3 vectors and to undertake external benchmarking when experimenting with different approaches to design.

3/3,AB/4 (Item 4 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01268192 99-17588
"Soft" skills and race: An investigation of black men's employment problems
Moss, Philip; Tilly, Chris
Work & Occupations v23n3 PP: 252-276 Aug 1996 ISSN: 0730-8884
JRNL CODE: WAC
WORD COUNT: 9725

ABSTRACT: Changes in skill requirements and the effects of these changes on black men's access to entry level-jobs are investigated, using open-ended interviews of managers at 56 firms in 4 industries. Managers reported that due to heightened competitive pressure, "soft skills" - particularly motivation and ability to interact well with customers and coworkers - are becoming increasingly important. Many managers view black men as lacking in these soft skills. This helps to explain black men's disadvantages in the labor markets.

3/3,AB/5 (Item 5 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00901512 95-50904
The global network organization of the future: Information management opportunities and challenges
Jarvenpaa, Sirkka L; Ives, Blake
Journal of Management Information Systems: JMIS v10n4 PP: 25-57 Spring 1994 ISSN: 0742-1222 JRNL CODE: JMI
WORD COUNT: 15639

ABSTRACT: Tomorrow's successful organizations will be designed around the

building blocks of advanced computer and communications technology. The success of these organizations will come from the ability to couple to, and decouple from, the networks of knowledge nodes. These networked organizations will link, on an as needed basis, teams of empowered employees, consultants, suppliers, and customers. These ad hoc teams will solve one-time problems, provide personalized customer service, and then, as lubricant for subsequent interactions, evaluate one another's performance. In the network organization: 1. structure will dominate strategy, 2 . credentials will give way to performance and knowledge, and 3. human resources will be the only sustainable advantage. Despite the promise, networked organizations present difficult information management challenges. Details are provided.

3/3,AB/6 (Item 6 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00833032 94-82424
Deindustrialization and Regional Economic Transformation: The Experience of the United States Industrial Change and Regional Economic Transformation: The Experience of Western Europe
Beyers, W B
Growth & Change v24n4 PP: 589-600 Fall 1993 ISSN: 0017-4815
JRNL CODE: GRC
WORD COUNT: 4766

ABSTRACT: A 2 -volume set, Deindustrialization and Regional Economic Transformation: The Experience of the United States and Industrial Change and Regional Economic Transformation: The Experience of Western Europe, edited by Lloyd Rodwin and Hidehiko Sazanami, is reviewed.

3/3,AB/7 (Item 7 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00783702 94-33094
Employment change and sectoral distribution in 10 countries, 1970-90
Godbout, Todd M
Monthly Labor Review v116n10 PP: 3-20 Oct 1993 ISSN: 0098-1818
JRNL CODE: MLR
WORD COUNT: 9092

ABSTRACT: The US led the pack of 10 industrial countries in an analysis of employment growth from 1970 to 1990. The US added 39 million jobs to the economy during this period. The countries studied were Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, the UK and the US. All of the countries experienced a major shift in the distribution of employment, from agriculture and industry into services. In addition to employment growth itself, the sources of the growth and the changing sectoral distribution of employment in these countries are examined. The composition of the rapidly growing service-sector industries is described, as are international employment trends by gender and by part-time and full-time status. The analysis ends with 1990 in order to exclude most of the employment effects of the cyclical downturns that all 10 countries experienced in the early 1990's.

3/3,AB/8 (Item 8 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00724532 93-73753
Reviving Rural Life
Coates, Joseph F.; Jarratt, Jennifer; Ragunas, Lara

Futurist v26n2 PP: 21-28 Mar/Apr 1992 ISSN: 0016-3317 JRNL CODE: FUS
WORD COUNT: 3370

ABSTRACT: Today's rural areas are a combination of occasional successes and numerous failures, with little or no room in between. The successes include retirement and recreation communities, area trade and government centers, academic communities, recreation communities, other entrepreneurial towns, and exurbs. The failures include those rural areas that base their economies on extracting a natural resource. Industries most associated with the rural economy, such as mining and agriculture, are expected to decline, offering fewer employment opportunities for rural residents. Rural successes demonstrate that country areas can revive and that some strategies are feasible. Factors that are converging to shape the future of the overall economy and that of rural communities include education reform, new technologies, government policies, and costs for building and maintaining infrastructure. These factors suggest 4 possible scenarios for rural life: 1. business as usual, 2 . women, but not men, finding work, 3. telecommuting centers, and 4. revival of rural communities.

3/3,AB/9 (Item 9 from file: 15)

00652213 93-01434
The Intelligent Enterprise a New Paradigm
Quinn, James Brian
Academy of Management Executive v6n4 PP: 48-63 Nov 1992 ISSN: 0896-3789
JRNL CODE: AEX
WORD COUNT: 8103

ABSTRACT: The key to future wealth and productivity in advanced industrial nations may be the development and use of technology for services. The organization of enterprises and effective strategies will depend more on the development and deployment of intellectual resources than on the management of physical assets. A truly maintainable competitive edge usually derives from developing depth in skill sets, experience factors, innovative capacities, know-how, market understanding, databases, or information distribution systems - all service activities - that others cannot duplicate or exceed. Strategic focus means concentrating on those particular skills, service activities, or knowledge elements in the value chain where the company is, can be, or must be "best in the world" to have the competitive advantage that its customers deem to be critical. The company must surround its selected core competencies with defensive positions that keep existing or potential competitors from taking over or eroding its selected positions.

3/3,AB/10 (Item 10 from file: 15)

00589547 92-04720
The New Workforce
Williams, James B.
Healthcare Forum v35n1 PP: 15-22, 48-54 Jan/Feb 1992 ISSN: 0899-9287
JRNL CODE: HPF
WORD COUNT: 9559

ABSTRACT: To effectively serve their communities and remain competitive, hospitals and health care systems must tap the intelligence, imagination, energy and dedication of a corps of workers who will differ in many ways from their predecessors. It is knowledge, the ability to use the information that technology renders increasingly available, that will prove key to organizational success in the future. Based on extensive data collection, the Hay Group has identified 5 key themes that encapsulate the

challenges facing the US' managers. These themes are: 1. **Knowledge - based** organizations will use more employee capacity. 2. Workforce bipolarization will occur. 3. A 2-tiered society will emerge. 4. The information age is more stressful. 5. Family issues will continue to insinuate themselves into the workplace. A compendium of resources to serve as an aid to hospitals and other health care organizations in managing diversity optimally is provided.

3/3,AB/11 (Item 1 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

02664372 Supplier Number: 65634811
Samsung to Introduce Over 10 Applications and Services at COMDEX/Fall 2000; New Offerings Reflect Continued Expansion of U.S. Operations.
Business Wire, p2373
Oct 2, 2000
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 1155

3/3,AB/12 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

07858262 Supplier Number: 65634811
Samsung to Introduce Over 10 Applications and Services at COMDEX/Fall 2000; New Offerings Reflect Continued Expansion of U.S. Operations.
Business Wire, p2373
Oct 2, 2000
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 1155

3/3,AB/13 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

12633784 SUPPLIER NUMBER: 65634811 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Samsung to Introduce Over 10 Applications and Services at COMDEX/Fall 2000; New Offerings Reflect Continued Expansion of U.S. Operations.
Business Wire, 2373
Oct 2, 2000
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1207 LINE COUNT: 00112

3/3,AB/14 (Item 2 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

11517850 SUPPLIER NUMBER: 56750677 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Different Service Firms, Different Core Competencies.
Davis, Tim
Business Horizons, 42, 5, 23
Sept, 1999
ISSN: 0007-6813 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 8041 LINE COUNT: 00678

3/3,AB/15 (Item 3 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10652827 SUPPLIER NUMBER: 21276832 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Real strategies for virtual organizing.
Venkatraman, N.; Henderson, John C.
Sloan Management Review, v40, n1, p33(16)
Fall, 1998
ISSN: 0019-848X LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 10592 LINE COUNT: 00931

ABSTRACT: Harmony among three vectors - customer interaction, asset sourcing, and knowledge leverage - and a strong IT platform form the strategy and structure of a business model for the knowledge economy. (Reprinted by permission of the publisher.)

3/3,AB/16 (Item 4 from file: 148)

09915839 SUPPLIER NUMBER: 19897421 (USE FORMAT 7 OR 9 FOR FULL TEXT)
World Employment, 1996-97: National Policies in a Global Context. (book reviews)
Brand, Horst
Monthly Labor Review, v120, n8, p41(2)
August, 1997
DOCUMENT TYPE: Review ISSN: 0098-1818 LANGUAGE: English
RECORD TYPE: Fulltext
WORD COUNT: 3352 LINE COUNT: 00291

3/3,AB/17 (Item 5 from file: 148)

09651465 SUPPLIER NUMBER: 18905152 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Technicians in the workplace: ethnographic evidence for bringing work into organization studies.
Barley, Stephen R.
Administrative Science Quarterly, v41, n3, p404(38)
Sep, 1996
ISSN: 0001-8392 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 19295 LINE COUNT: 01675

3/3,AB/18 (Item 6 from file: 148)

09319840 SUPPLIER NUMBER: 17949659 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Get the best from employees with learning disabilities. (includes related articles)
Flynn, Gillian; Hayes, Marnell L.
Personnel Journal, v75, n1, p76(6)
Jan, 1996
ISSN: 0031-5745 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 3750 LINE COUNT: 00296

ABSTRACT: Learning disability (LD) is an impairment that makes it difficult for a person of otherwise normal ability to learn and apply certain kinds of knowledge effectively. It is coming to be recognized as a serious business problem because it is estimated that around 10% to 15% of workers in major US corporations are learning-disabled. Adding to the challenge of dealing with this problem is the difficulty of identifying these employees. Unlike physical impairments, LDs are not readily apparent. Symptoms of this disability, such as lack of focus, non-compliance with instructions, 'poor judgment' and inability to pick up social cues, may be seen as performance problems and legitimate reasons for not promoting employees and even for terminating them. Companies can no longer afford to

neglect this segment of the population in view of the predicted labor shortage. Measures for developing and maximizing the potential of slow learners are recommended.

3/3,AB/19 (Item 7 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

05927276 SUPPLIER NUMBER: 12137381 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Reviving rural life.
Coates, Joseph F.; Jarratt, Jennifer; Ragunas, Lara
Futurist, v26, n2, p21(8)
March-April, 1992
CODEN: FUTUA ISSN: 0016-3317 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 3665 LINE COUNT: 00307

ABSTRACT: Deterioration of rural areas economically dependent on mining, manufacturing and agriculture can be successfully turned around if the areas become service providers. There is a future for rural communities that serve retirees, allow shopping centers, have government facilities and promote natural recreational attractions.

3/3,AB/20 (Item 8 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

04639582 SUPPLIER NUMBER: 09270621 (USE FORMAT 7 OR 9 FOR FULL TEXT)
The nature of the information sector in the information society: an economic and societal perspective.
Jeong, Dong Y.
Special Libraries, v81, n3, p230(6)
Summer, 1990
CODEN: SPLBA ISSN: 0038-6723 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 3305 LINE COUNT: 00283

3/3,AB/21 (Item 9 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

02485739 SUPPLIER NUMBER: 03960696 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Construction's high-technology revolution.
Moavenzadeh, Fred
Technology Review, v88, p32(10)
Oct, 1985
CODEN: TEREA ISSN: 0040-1692 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 4831 LINE COUNT: 00390

3/3,AB/22 (Item 1 from file: 20)
DIALOG(R)File 20:World Reporter

13101017
Samsung to Introduce Over 10 Applications and Services at COMDEX/Fall 2000; New Offerings Reflect Continued Expansion of U.S. Operations
BUSINESS WIRE
October 02, 2000
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 1166

SAN JOSE, Calif.--(BUSINESS WIRE)--Oct. 2 , 2000--Samsung SDS

America, the U.S. division of Korea's $1 billion information technology company Samsung SDS, plans to introduce over 10 software applications and services at COMDEX/Fall 2000, held in Las Vegas in November. The new offerings are part of the company's ongoing strategy to strengthen its application software business in the U.S.

Software applications and services being introduced at COMDEX include CADnPart, e-DataCenter service offerings and solutions, Single2000, uniERP2000, REQUBE, Smart Card, uniCheck, Avatar 3D animation solution, and WiseVIEW.

?type s3/9/1

3/9/1 (Item 1 from file: 15)

02181929 74207999

Strategic performance appraisal in team-based organizations: One size does not fit all

Scott, Susanne G; Einstein, Walter O

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ABSTRACT: The pervasive use of teams in today's organizations makes employee performance appraisal more challenging than in the past. Unfortunately, prescriptions offered in the business press often fail to consider the diversity of team forms used in team-based organizations. This article identifies 3 team types and examines the fit between performance-appraisal characteristics and team types. Performance-appraisal characteristics include target, type, and data source. The analysis underscores the critical need for effective leadership in designing and implementing performance appraisal systems in team-based organizations.

TEXT: Executive Overview

The pervasive use of teams in today's organizations makes employee performance appraisal more challenging than in the past. Unfortunately, prescriptions offered in the business press often fail to consider the diversity of team forms used in team-based organizations. Teams differ in their membership configuration, the complexity of their tasks, and level of interdependence from other organizational units. In this article, we identify three team types and examine the fit between performance-appraisal characteristics and team types. Performance-appraisal characteristics include target (individual or team), type (outcome, behavioral, or competency-based), and data source (manager or multirater). Our analysis underscores the critical need for effective leadership in designing and implementing performance appraisal systems in team-based organizations.

In the early 1990s, a prominent high-tech firm in the northeastern United States enthusiastically rolled out a new performance-management system to improve the performance of its professional work teams. The program was comprehensive, with details contained in two large, beautifully written, leather-bound volumes prepared by external consultants following nearly a year of work. Top management introduced the program with much public fanfare and pledges to implement it.

Three years after the launch, the second author happened to run into a colleague who was doing research at the firm on the human resource system and productivity:

Q: How's the performance management system working?

A: What performance management system?

The program introduced with such hope had come and gone within the space of a year, leaving in its wake frustration, anger, and cynicism.

This may be an extreme example. But it is no secret that many performance-appraisal systems fail to deliver their anticipated benefits in team-- structured organizations. Working with teams in our consulting practice has convinced us that onesize-fits-all performance-appraisal systems are largely to blame. A generic system applied across an organization ignores important differences among teams. For example, intact, colocated work and service teams still attend to the core work in many organizations, while virtual teams, geographically or organizationally dispersed, are used for more complex tasks.1 This trend has accelerated with the move from a manufacturing to a **knowledge -based** economy. In the same organizations, we often see rapid-response teams of loosely networked professionals who manage strategic initiatives in the face of technology change, continued globalization, and hypercompetition **2**

These are all teams, yet each presents a different challenge to performance management and its bedrock-employee performance appraisal. Employee performance appraisal influences motivation and development, provides documentary support for rewards and recognition, and links the activities of individuals to organizational effectiveness. But the movement to team-based structures in the 1990s raised new questions and revived old controversies regarding the efficacy of traditional appraisal systems.

For example, who should be appraised in team-- structured organizations-individuals or teams? Should the focus of appraisal be on attaining specified outcomes, or on nurturing appropriate behaviors to achieve those outcomes, or on acquiring competencies and skills? Should the focus be the same or different for individual and team appraisal? And who should provide the data on performance-ac manager who is not really part of a team? Other team members? Customers?

Designing effective performance-appraisal systems requires careful consideration of a number of team contingencies. In this article, we discuss three-team membership configuration, team task complexity, and the nature of the interdependencies among a team and external groups-that, when taken together, define three prototypical team types. We then specify the appropriate performance appraisal target, type, and data source for each type. To ground our discussion, we begin with a brief review of what is meant by employee motivation and performance, and specify how three different types of performance appraisal-- outcome, behavior, and competency-based-affect these processes.

Employee Motivation and Performance

Performance appraisal influences employee motivation by identifying and specifying mutually agreed on outcomes (outcome-based performance appraisal); directing attention to specific tasks, objectives, and assignments and specifying the behaviors that are needed to accomplish them (behavior-based performance appraisal); recognizing skill acquisition and identifying skill deficits for further training and development (competencybased performance appraisal); providing feedback on progress toward outcome attainment and actual task performance (outcome and behavior-based performance appraisal); and establishing the process and providing the rationale for distributing rewards (outcome-based, behavior-based, and competency-based performance appraisal).3
Outcome-based performance appraisal is used most successfully when it is part of a comprehensive goal-setting program that includes clearly defined, specific, challenging goals.4 Appraisal of behavior has possibly been the most used form over the last 30 or so years, and it involves identifying and rating observable behaviors relevant to individual work roles. Finally, competency-based appraisal consists of assessing an individual's skills or knowledge relative to that required to perform a specific job.5

Work Roles and Performance-Appraisal Criteria

Performance appraisal, whether outcome-, behavior-, or competency-based, traditionally focuses on the formal requirements of specific jobs. With the

introduction of team structures, employee-involvement programs, and total quality management, employee roles in the workplace have expanded, and now include activities that go beyond task performance. The following work roles have been identified as important in today's workscapes:6

* Job role: Concerned with quality, quantity, and customer service provided.

* Context role: Being a good organizational citizen, continuous improvement of organizational processes, personal self-development in career, and continuous learning.

* Teamwork role: Collaborating in problem solving and conflict resolution, communicating openly, goal setting and performance appraisal of the team, as well as planning and task coordination among members.

Employee job-role performance contributes most directly through the organization's core technical processes, while performance in context and teamwork roles contributes to the broader organizational, social, and psychological setting in which job-role performance occurs.7 Generic performance appraisal systems that specify work-role definitions, behavioral descriptors, and competencies are available in the commercial market, or organizations can develop their own. In either case, it is important to involve employees and supervisors early in the process to assure their acceptance of the system.8 Mutual development by employees and supervisors of work roles, and the outcomes, behaviors, and competencies necessary for their enactment, serves four purposes:

* influencing employees and supervisors to think deeply about which of the roles are most supportive of department goals and of the organizational mission;
* providing specific direction on the behaviors and competencies needed to adequately perform in each role;

* communicating to supervisors which roles an employee is most interested in; this information can be considered for future job assignments;

* resulting in a concrete agreement between employees and supervisors on where time and energy will be focused.

Sources of Performance Data

Much has been written about the use of 360-degree (multirater) feedback as an effective tool for performance appraisal.9 At its most basic, a multirater feedback system gathers ratings of an employee's work-role behaviors from those in the best position to observe it, including subordinates, customers, and peers, as well as supervisors. Since its inception in the early 1990s, 360-degree performance appraisal has been criticized as often as lauded. A number of recent articles have summarized concerns with the validity of the measurement instruments, the process through which they are administered, and how the feedback is eventually used by organizations.10 Yet many scholars and managers agree that multisource feedback is fundamentally a good idea that deserves further development.

We will not review the technical discussions related to the validity of 360-degree feedback instruments, which have been thoroughly covered elsewhere,11 other than to note that such discussions are important with any performance instrument. Experts do agree that 360-degree performance appraisal should:12

* be used more for employee development than for making personnel decisions;

* be part of a formal goal-setting system;

* be administered on a regular basis rather than only once;

* provide aggregated, anonymous feedback to recipients;

* assure that raters evaluate employee behaviors only in work roles for which they have adequate knowledge and first-hand experience;

* provide orientation and training to performance raters;
* provide training and guidance on effectively interpreting and constructively using feedback to recipients.

Performance Appraisal Target: Team Member or Team?

Despite admonitions by many management scholars and consultants to abandon individual performance appraisal for team appraisal,13 U.S. corporations have been slow to do so. Their reticence may be justified, as team effectiveness is founded on individual behavior and performance, and individuals vary in the amount of effort and capability they bring to the workplace. Social loafing is likely to result when individual effort is not recognized and assessed. This conscious or unconscious tendency to shirk responsibilities by withholding effort toward group goals while sharing in rewards occurs more often when group members believe that their individual contribution (or lack thereof) cannot or will not be identified or assessed. People do show fewer signs of social loafing in small teams than in large groups, but they are still more likely to loaf when rewards (including recognition) are tied to team effort rather than individual effort.14 This tendency is markedly stronger in individualistic western cultures than it is in more collectivist societies such as Israel and Japan.15
If a team must support a free rider without recourse, other team members often withdraw effort.16 Social loafing spreads among team members like flu, poisoning the work climate. Individual performance appraisal helps discourage social loafing by providing each team member with feedback on the acceptability of his or her individual behavior, and on the need to further develop skills and competencies. High-ability team members are likely to be reassured that equity will be restored, and that all members will have the necessary skills and abilities to contribute.

Individual-level performance appraisal helps reduce social loafing, but it ignores the interaction and synergy that characterize excellent team performance. Team performance assessment gives a team the information it needs to identify team problems and to develop team capabilities. It heightens team pride and ownership, increasing commitment and identification of members with the team. Many team performance measurement systems, such as that at Xerox, are developed jointly by teams, managers, and customers as part of total quality management efforts.17 Joint accountability helps assure that the criteria and standards for performance are aligned with organizational and team strategies. Such measurement systems are largely outcome-based with some behavioral measures, but there is little reason that they could not also include team competencies. Teams are typically trained to prepare and interpret their own performance data as part of continuous improvement efforts.

Team Types and Performance Appraisal

In this section, we examine the fit of performance appraisal target, type, and data source with different types of teams. We begin by identifying three types of teams-work teams, project teams, and network teams-based on two important dimensions-membership configuration and task complexity. (See Figure 1.)

Membership configuration refers to the expected tenure of a team, the stability of its membership, and the allocation of members' work time, and it varies along a continuum from static to dynamic.18 Static teams are characterized by full-time team members, membership that remains constant throughout the life of the team, member expectations of a future, and a common level of activation or involvement of members throughout the life of the team. At the other extreme, dynamic teams are characterized by shorter

tenure tied to task completion, members who come and go depending on task demands, and members who also work on other teams or nonteam tasks simultaneously.

The second team dimension, task complexity, recognizes that organizational teams engage in a wide variety of work that varies from the routine to the nonroutine.19 Routine tasks are well scripted and defined, and people encounter relatively few exceptions to the rule in completing them. Cycle time (the time needed to finish one complete unit of work) on routine tasks is specified in advance and is of relatively short duration. Outcomes are easily assessed soon after task completion against specific, quantifiable criteria. In contrast, nonroutine tasks tend to be emergent-the desired outcome and the means to accomplish it are impossible to define in advance. At the extreme, everything encountered in performing a nonroutine task is an exception to the rule. Nonroutine tasks require applying multiple knowledge bases or skill sets learned through education in specific disciplines or through extensive training. Cycle time is longer on nonroutine tasks and indeterminate; at the extreme, cycle time can be decades, such as in developing a new drug.

FIGURE 1

The dimensions of membership configuration can vary independently. For instance, an airline flight crew is stable, with dedicated members, but of short duration. The dimensions of task type can also vary, but we find common patterns among them that define three types of teams used in organizations.

Work or service teams

At one extreme of membership configuration and task complexity, we find intact work teams engaged on routine manufacturing or service tasks. Those in production at Saab, Saturn, and Xerox are good examples that have been discussed often in the business media. These teams have been in existence for a long time, their membership has changed little or not at all since formation, and team members anticipate membership stability in the future. Members have similar skill sets and are cross-trained to perform many of the tasks necessary for the team to reach its goals. The team's tasks are standardized, cycle time is generally short, and multiple task cycles occur in each performance appraisal period. The team's output tends to be easily and objectively evaluated, there is minimal disagreement among stakeholders about the criteria for success, and feedback on performance is often provided by the task itself.

The work team is a well-developed social system. Members have interpersonal knowledge of each other's likes, dislikes, and personalities such that task interaction is more predictable. The quality of interpersonal relationships is important to all members. Trust reflects knowledge gained over time through experience with each other, but trust is also a matter of confidence that the needs, preferences, and goals of all team members are similar. This is enhanced by the team's regularly engaging in team building and training as an intact unit.

As shown in Table 1, individual and team performance appraisals are recommended for work and service teams. Conditions operating in these teams-an atmosphere of trust, expectations of a future together, shared knowledge of members' differences and similarities, and shared interest in the continuous improvement of the team members and the team-create an optimal environment for conducting performance appraisal at both the individual and team levels.

These same conditions make peer ratings a useful supplement to managers' evaluations of individual team members' behaviors and competencies assuming other conditions of use are met. For instance, the feedback report is used only for developmental purposes, and individual raters' anonymity is assured. Team members are in a good position to assess and certify each other's competencies related to job and nonjob roles, as they have personal knowledge of and experience with them. They also are in an excellent

position to assess each other's job behaviors because they observe them daily. Since the team works together over multiple appraisal cycles, useful feedback can be given on improvements that have occurred in individual behaviors and competencies since the previous appraisal. The feedback report also provides a foundation for individual goal setting, and for a constructive dialogue among members on how to improve team functioning.

Outcome-based performance appraisal is recommended for the team but not for individual team members, as the tight interdependence among team tasks makes it difficult to accurately determine who did what toward achieving team goals. (If this is not the case, we question whether a team actually exists.) Individual outcome-based appraisal shifts the team's focus from teamwork to individual work and promotes a view of teamwork as no more than the sum of the individual parts. It encourages finger pointing and assigning blame by the team rather than problem solving, and it undermines concepts of mutual accountability.

Table 1

Yet individual team member task proficiency is essential to team effectiveness,20 and feedback to team members on their own task accomplishment helps them regulate their own performance.21 Thus work and service team members are typically responsible for monitoring and documenting their own performance on individual tasks. This information is then used by the team as a whole to identify training and development needs and plan skill-building exercises for each member.
At the team level, measurement systems often reflect various types of outcome measures (e.g., productivity, sales volume, and customer complaints), and these act as a signaling device to the team for problem solving and corrective action. Teams are held accountable for monitoring and documenting their own performance against standard goals and against team goals, and they are also held accountable for results. When outcomes do not meet standard or team goals, teams are responsible for exploring potential sources of performance variability and for minimizing and eventually eliminating those over which they have control. Sources of variability outside the team's control are also identified and documented for management action. It is difficult to conceive of a situation where teams have 100 percent control over outcomes, and it is important that this be acknowledged. The weaker the effort-performance linkage (the more factors outside the team's control affect performance), the more important it is that behavioral measures be used to supplement outcome-based measures. Behavioral measures can include jointly attending team-training sessions during the performance cycle and arranging equal opportunities for all team members to master task proficiencies through job rotation.

Three hundred and sixty-degree feedback is sometimes collected on teams as a unit, and most of the same principles apply as those identified for individual multirater feedback. This type of feedback from internal and external customers can be especially useful when work teams are delivering a service and objective measures are difficult to identify. But care must be taken that raters actually assess the team as a unit rather than just the one or two members of the team with whom they interact.

Project teams

Project teams are distinguished from work teams by expectations of a limited future. Members are assembled for a specific purpose and they expect to disband once their task is complete. Well-known examples of successful project teams include the team that developed the first of IBM's PCs and the team that developed the original Taurus/Sable at Ford. Projects can range from relatively short to longer term, but members know they are on loan and will return to their functional areas on completion of the project.

Project teams engage in work that is outside the core production or service work of the organization and inherently less routine than that of work or service teams. Members typically come from different functional

areas and have differentiated skills and knowledge bases; they lack expertise or deep understanding of each other's specialties. The difficulty and the tempo of team tasks vary across the life of the project and members' involvement waxes and wanes with project need. Project teams must learn and adapt to task realities.

As a result of their particular task demands and membership configuration, project teams tend to be focused more on tasks than on team members.22 Project teams have high goal interdependence among members-they are dependent on each other to meet project goals-but the degree of task interdependence among members varies considerably. Training and development of members does not occur as an intact unit, and members are left to apply and integrate individual training with their team experience. Team members' competencies include functional expertise, political skills, creative problem solving, and critical decision making skills, but there is less emphasis on team self-management skills.23 Paradoxically, team self-management is often less appropriate in these teams of highly educated specialists than it is for work and service teams. Members are functional specialists rather than team specialists, and the priority on meeting project deadlines makes it difficult to engage in team training. In general, the less variable membership dynamics are, and the more routine the task, the more possible and desirable it becomes to move leadership and routine management functions into the team and to make members jointly responsible for team goal attainment. As team-membership dynamics become more fluid and team tasks become more specialized, there are greater needs for coordination and integration of the work across time, space, and members, and strong centralized leadership becomes more critical to goal accomplishment.

The determinant existence and shorter duration of project teams limits the usefulness of team outcome-based assessment because the project cycle does not coincide with the typical appraisal cycle. End-of-project outcome measures do not benefit the team's development as the team has likely dissolved by then. Instead, metrics are developed that relate to the various stages of a project so that teams can self-correct before things go too far off course. These include the continuous tracking of time, cost, and returnon-investment, as Hewlett-Packard does in its product development teams.24 Interim metrics are carefully designed with the input of project team members to eliminate or account for extraneous sources of variability that the team does not control.

Team members are expected to understand team metrics, work together to track them, revise them as needed, and use them to set downstream project goals. Multisource performance appraisal is particularly useful for rating performance of project team members on these behaviors and competencies. Because project team members are assigned and reassigned to different projects and often serve simultaneously on multiple teams, no one functional manager, team leader, or set of peers observes behavior over the many different work situations in which they perform. Under these circumstances, it makes sense to collect ratings from each of the team leaders and team members of the various projects an employee participates in during a performance cycle.

Project leader and peer ratings are good sources of behavioral ratings related to a team member's context and teamwork roles. But peers lack knowledge of other members' functional disciplines or understanding of their technical specialities, and they generally cannot assess the goodness or value of individual team members' inputs. As shown in Table 1, functional managers, who are responsible for technical mentoring, and who typically retain administrative responsibility for employees,25 are in a better position to provide behavioral ratings of job roles and to assess competencies pertaining to specific functional expertise. Functional managers and employees use the feedback report from peers and project leaders to identify developmental needs and schedule training. Thus people who are assigned to project teams as part of their job roles are rated on both their individual performance and their contribution in their team role. Training focuses on the development of behaviors and competencies

that are transferable from one team assignment to the next.

Network teams

Network teams are virtual in that their potential membership is not constrained by time or space; they include geographically dispersed members who collaborate through a combination of telecommunications and information technologies.26 Their membership is not limited by organizational boundaries, and frequently includes contingent workers, customers, vendors, and consultants, as well as organizational employees. It is difficult to draw boundaries around a network team, as potential membership includes all who are committed to the goal.

Network teams also differ from project teams because their work is extremely nonroutine. Most network teams engage in one task cycle, the nature of which is unlikely to be repeated. For example, Fleet Focus, a team composed of dispersed specialists, was assembled by Fleet Financial Group of Providence, RI, to reorganize and reengineer Fleet's structure and processes during its acquisition of Shawmut Bank's portfolio in 1994. A similar network team functioned during Fleet's merger with BankBoston in 1999.

Membership configuration in these teams is dynamic, shifting in response to changing task needs, which are themselves emerging in response to rapidly changing environmental and technological conditions and from unique interactions among customers, suppliers, and team members. The timing and intensity of members' participation and the nature of the interaction and level of exchange among members is not scripted, but is dependent on task needs. Network teams are rapid-response units charged with strategically responding to market challenges and exploiting market potentials. Thus their primary competency is the ability to rapidly select and assemble the most appropriate member configuration for the task at hand, even when that task cannot be clearly specified. Team performance is a matter of strategic responsiveness.

The performance emphasis for team members shifts from what they did yesterday or last year to what they are willing and capable of doing tomorrow, where tomorrow is still largely undefined. Network teams, more than any other, rely on a cadre of potential members who are continuously engaged in self-directed learning to improve skills, knowledge, and competencies. Team members must be able to continuously reframe and rethink how things are done. Further, because membership configuration and task requirements are emergent and dynamic, collaborative, intensive communication is especially important to coordinating effort and achieving team effectiveness. Distant members must rely on electronic technologies to maintain coordinated action and commitment to goals. These include audio and video teleconferencing, chat groups, e-mail, bulletin board software, group decision-support systems, and project-management calendars.

Network teams are transitory structures that engage in unique tasks as they arise. Their performance cycle is at odds with annual performance--appraisal systems, and performance of the team as a whole is often not assessed in any formal way. However, there is evidence that this type of improvisational action is becoming increasingly important to organizations operating in highly turbulent industries, and it is important that their employees be prepared to participate in network teams as needed.27 Thus appraisal is focused on developing individual capacity to initiate, participate, and lead improvisational action, rather than on assessment of past outcomes.

Competency-based appraisal systems are optimal for assessing the potential of all employees to participate in network teams. Knowledge, behaviors, and skills, including individual adaptive ability, are appraised and used for evaluation and developmental purposes. Behavior-based appraisal can also be used to assess the extent to which employees participated in learning activities during performance cycles. These can be selfpaced programs, in-house training, or courses at educational institutions. To avoid simply rewarding attendance in training programs, employees are assessed on the

extent to which they apply learning to current activities, set developmental goals, and seek out feedback from others as an input into the self-regulatory process.28 Finally, behavior-based appraisal is used to assess the extent to which members engage in collaborative communication and teamwork behaviors when participating in network teams. Multirater behavioral assessment is essential in networked organizations, because team members are working in multiple performance settings during any given performance cycle.

External Interdependence: A Final Contingency

Our analysis would be incomplete without considering the interdependencies among a team and other teams, individuals, and groups within an organization. At its simplest level, interdependence exists when a team is dependent on the contributions of nonmembers to complete tasks and goals. High interdependence exists when teams are dependent on multiple outsiders for information, resources, and support, and, when the need for the exchange emerges with the task, such exchanges are not well understood and procedures for them are not formalized. Low interdependence implies that teams are dependent on only a few outsiders, and procedures can be set up to manage the exchange of resources and information.

As the complexity of interdependence increases, teams face escalating needs to manage extensive interaction with others inside the organization. Care must be taken to assure that performancemeasurement systems focused at the team level do not encourage teams to optimize their own performance at the expense of other teams and the system as a whole. Motorola's experience with team incentive systems is instructive in this regard. The firm found that the outcome of focusing on team productivity in its production facility was anything but teamwork. While some teams did perform better, the cost of open competition, griping, and conflict among teams caused suboptimization in the plant as a whole?29 Team-focused outcome measures are important tools for team-development purposes, but the more the team is interdependent with others, the greater the need is to balance outcome measures with behavioral measures related to citizenship and teamwork with other teams.

Putting It All Together

One-size-fits-all prescriptions for performance appraisal methods are still all too common, despite strong differences among the types of teams commonly found in organizations. Further, the three types of teams we discussed here do not cover all the possible permutations of team membership dynamics, task complexity, and internal and external interdependencies. Project teams or work teams certainly vary greatly in work organizations. Such teams are prototypical; real teams must be evaluated on many dimensions to determine the most useful and appropriate performance-appraisal target, type, and data source.

As teams move from the stable, routine, and selfcontained end of the continuum to the dynamic, emergent, and interdependent end, performance--appraisal systems must move from a focus on the outcomes, behaviors, and competencies of teams to those of individuals. At one extreme-the intact work or service team-the focus is on developing better teams. At the other extreme-network teams-the focus is on developing better team members. These members include those who can and will accurately and quickly assess the task and interpersonal idiosyncrasies of their interaction partners at any given moment and adapt their behavioral repertoire to fit the unique needs presented by both.

Effective performance appraisal is a matter of fit between characteristics of the team and the target of assessment, as well as the rating type, source, and purpose. Performance-appraisal systems that result from careful consideration of these contingencies have the greatest probability of being effective-that is, of eliciting employee behavior that contributes to an organization's goals. Allstate Insurance, Xerox, Hewlett-Packard, and many other organizations have demonstrated that a strategic approach to performance-appraisal design dramatically increases the likelihood that

team structures will contribute to greater organizational effectiveness.30

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Susanne G. Scott is an assistant professor of management in the Charlton College of Business, University of Massachusetts Dartmouth. She has a Ph.D. from the University of Cincinnati. Her research on team effectiveness, team and organization identity, and leadership has appeared in leading academic journals. She conducts training seminars on leadership stalls, team-based structures, collaboration, and organizational change. Contact: sscott@umassd.edu.

Walter O. Einstein is a professor of management in the Charlton College of Business, University of Massachusetts Dartmouth. He has a Ph.D. from Syracuse University. He specializes in management development, and consults and has written extensively on leadership skills and the design of theory-based, practical performance appraisal. Contact: weinstein@umassd.edu.

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Abstract: In recent years, a number of computerized work **measurement** systems have been developed. In particular, attempts have been made to computerize the manual versions of existing predetermined motion- **time** systems (PMTS). This can be attributed to the spread of computer technology in the last decade which may further the application of PMTS in manufacturing industries in terms of speed, ease of use, and minimization of degree of judgement on the part of the analyst in establishing **time** standards. The main objective of the paper is to survey the various computerized PMTS. In particular the authors examine the computerized systems of methods- **Time measurement** (MTM), modular arrangement of predetermined **time** standards (MODAPTS), and **Maynard operation sequence** technique (MOST) due to their popular and worldwide support. The background and computer application of the aforementioned systems are discussed. Furthermore, comparative examples are given to illustrate the advantages and limitations of each system. (15 Refs)

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Descriptors: manufacturing industries; operations research; scheduling

Identifiers: motion- **time** systems; manufacturing industries; computerized work **measurement** systems; predetermined motion- **time** systems; PMTS; methods- **Time measurement** ; MTM; modular arrangement of predetermined **time** standards; MODAPTS; **Maynard operation sequence** technique; MOST

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ABSTRACT: Work-measured labor standards are useful tools applicable to many areas of business. Manufacturers generally have a bill-of-materials system to determine standard parts cost, but they do not have an equivalent bill-of-labor system to determine standard labor costs. Basically, manufacturers need to formalize their labor times, and their labor costs. If the standard labor times are realistic, costing is more accurate, and delivery times are also more accurate. Five techniques are commonly used to develop standard times: 1. motion analysis, 2. **time** study, 3. activity sampling, 4. historical data, and 5. estimates. Since nearly all manufacturers are already using standard times in one form or another, using work **measurement** to develop these items is simply an improvement on what they are already doing.
TEXT: Work-measured labor standards have been around for about a century, and they will continue to be around for the foreseeable future. They are useful tools applicable to many areas of business. Perhaps the only thing wrong with these tools is their lack of a buzz word or catchy acronym. Maybe they should be called WMLS to keep up with the times.

For many years, work-measured labor standards were recognized as being very helpful in identifying remedies for those companies ailing from productivity problems. Dr. W. Edwards Deming was one of the first persons to down-grade labor standards. Point 11b of his famous 14 points states: "Eliminate numerical quotas for the work force." I happen to agree with this philosophy.

Using labor standards to determine workers' pay has generally proven to he demoralizing and adversarial--and ineffective in the long run. Workers end up achieving 150-200 percent of the old standards, or perhaps they simply loaf around once the standard is met. Stock holders are unhappy; management is unhappy; and workers end up losing respect for management. It's a demoralizing situation for everyone. Labor standards are not really useful for whipping workers into being productive. Dr. Deming's point makes sense.

But have you ever had to cost out a product or service, or cost estimate a proposed new product or service? Have you ever had to schedule a job and give a customer an estimated delivery date, and then organize workers to produce the product? Have you done any simulation? What did you use to determine the labor times? Was it just magic? Of course not. You used some form of standard times, even if there were only quick estimates on a napkin over lunch.

If you're a manufacturer, chances are you have a bill-of-materials (BOM) system to determine standard parts cost. Do you also have an equivalent bill-of-labor system to determine standard labor costs?

Basically, you need to formalize your labor times, and your labor costs. If your standard labor times are realistic, your costing is more accurate, and your delivery times are also more accurate. The complaint "I can't afford to set standard times" should be followed by the question "Can you afford not to?"

Let's be realistic about it. There is no such thing as an "accurate" labor standard **time** . Human workers come in at least a billion models with varying physical, mental, and emotional specifications and work under varying environmental conditions. This variety makes "average" or standard times extremely difficult to determine. Standard times are standard times

only because all parties involved agree they are standard times. This is an important point.

The key is to quickly and economically develop and maintain standard times that are as close to real life as possible.

Developing standard times

Five techniques are commonly used to develop standard times: motion analysis, **time** study, activity sampling, historical data, and estimates.

Motion analysis--This technique involves dividing a task into its component motions, then looking up the motion times on a chart or data card of a predetermined motion times system (PMTS). PMTSs currently in use include Methods **Time Measurement** (MTM), **Maynard Operation Sequence** Technique (MOST), Modular Arrangement of Predetermined **Time** Standards (MODAPTS), Master Standard Data (MSD), Motion Standard Times (MST), and WorkFactor.

Motion analysis is applicable to short-cycle, highly-repetitive tasks. Most PMTSs have been computerized by one or more vendors. Computerization ranges from rapid code validation and automatic calculation, to question and answer scenarios, to interactive expert systems. Choosing a PMTS is basically a matter of finding one you like, then selecting the computer implementation that is appropriate and affordable. Computerized PMTSs are typically part of larger, often expensive, standards management software. Applying a PMTS can be **time** -consuming, whether it's computerized or not. However, a PMTS forces you to look at the method you use to accomplish a particular job, which promotes methods improvement. But, remember, a PMTS is best for short-cycle, highly-repetitive tasks.

Time study--The most widely used tool to develop standard times is still **time** study. **Time** study reflects what is happening in your job or project. It is also easy to learn and use. Now, the PC has made summarization of **time** study data a matter of seconds instead of hours.

A computerized study is taken on an electronic hand-held data collector by assigning a code number to each element. Element codes are entered into the data collector as they occur. A **time** key is pressed at the end of each element, at the breakpoints. The data becomes a series of code, **time** , code. **time** , etc. Rating or leveling factors are also entered into the data collector. Data are then sent to the PC for almost instant summarization. Statistical error figures and graphical histograms can quickly point out any highly variable elements, possibly indicating a bad method.

The real key in computerized **time** study is actually the data collector, not the software. For example, many firms have used spreadsheet software for summarization. However, taking the study by stopwatch and typing the values into the spreadsheet saves little if any **time** . But it does invite entry errors. It's far better to use a data collector or hand-held computer--even a laptop computer--for conducting the study. This applies no matter what software you use for summarization.

Activity sampling--An often overlooked tool is activity sampling, usually called work sampling by North American IEs. In this technique, a group of workers are observed at random times and their individual activities noted each tour. After a week or two, the average **time** spent on each activity can be calculated, and statistically justified. The average **time** per piece can then be determined.

Activity sampling can quickly establish standard times on highly variable or long-duration tasks. The key to fast and easy activity sampling is an electronic data collector and PC software. Subject or activity codes are entered into the data collector. The data are then sent to the PC on a daily basis. This allows for almost instant summarization at any **time** during the course of a study. Activity sampling can also uncover bottlenecks and determine reasonable allowances.

Historical data--This really is not a tool as much as it is a good shop practice. Keep accurate job records. If you have an electronic job clock system, historical times from past jobs offer an excellent source for standard times. As methods change, the standard times gradually change, using a moving average approach. This can be especially beneficial on long tasks that might change from job to job as methods improve.

Estimates--A well-reasoned estimate is what makes a standard a good standard, especially for seldom-performed, highly variable tasks. Be sure to get estimates from at least three people who do the task. Then average them, and discuss the average with all three individuals. Put it in your computerized standards system.

Let's quickly review the techniques, and put them into perspective according to the tasks for which they apply:

* Motion analysis: very short, repetitive tasks

* **Time** study: short, repetitive and variable tasks
* Activity sampling: longer, variable tasks

* Historical data: long, repetitive and variable tasks

* Estimates: seldom performed, variable tasks

The main point is this: Use the tool that develops the standard **time** consistent with the type of task involved. Use a computer program if a large amount of data is involved, such as **time** study and activity sampling data.

Maintaining standard times

Far too many U.S. companies have developed--or had a consultant develop--standard times and then stopped there. One of the biggest problems in American industry is "creeping methods changes." Methods improve, but acceptable standard times are not updated to reflect the newer standards. It is as important to update your standard times as it is to develop them in the first place.

How can you do that economically? A computer can help a great deal. Although you can use spreadsheet and database software, programs are available specifically for maintaining standard times. The programs typically store measured times, then use them to develop and maintain worker and product standards. Such programs feature several "levels" of standard times, but they can usually be characterized as having three major levels: elements, operations and routers.

Elements--Individual work-measured times are often referred to as standard elements or standard data. Some companies maintain standard data in ring binders, but most don't even bother cataloging individual work-measured **time** elements. A PC-based system encourages standard data development and application because it simplifies the process and eliminates extra paperwork. Most software programs offer integrated motion-level standard data in the form of an integrated PMTS. But your **time** study, activity sampling, historical data, and estimate elements are also legitimate standard data elements. Such elements can be cataloged in a computerized standards system for rapid application to worker standards. This is much faster than looking them up in a ring binder.

Operations--Worker standards are often referred to as **operation** or process standards. and are typically paper stems just begging for computerization. The operations or process level is the core level in any PC-based standards system, and it often offers side benefits such as manufacturing line balancing. Frequencies, allowances, internal elements, setup elements, workplace layouts, assembly sketches, operator instructions, and other worker-oriented aspects are also handled at this level.

Routers--Product standards are usually called routers or routings, and then

summarize setup and run times from several operations. Costing and scheduling are accomplished at this level. Routers are typically computerized as parts of an MRP II or other mainframe costing system. However, routers can also be part of a PC-based standards system, offering automatic updates as **operation** times change (Figure 1).

Like any standards system, a computerized standards system won't help--and can be counter-productive--if it is not kept up-to-date. If you expect to continue to produce accurate labor costs and cost estimates, and meet promised delivery dates, keep your labor standards current. Actual **time** spent updating isn't burdensome, especially when your standards are computerized.

Most computerized standards stems feature an integrated PMTS to help the user develop standards. But don't let that be your primary purpose for "buying into" computerized standards. Maintaining your standards comes first. Look upon an integrated PMTS as a bonus, but just for those highly-repetitive short-cycle tasks. The primary purpose of a computerized standards system should be to manage standards, not create them.

Summary

Since practically everyone is already using standard times in one form or another, using work **measurement** to develop these times is simply an improvement on what you are already doing. (You're using times from some source, even if they are simply educated guesses.) Computerization nor only speeds development, but fosters maintenance of standards.

Borrowing from the style of late Dr. Deming, perhaps Dossett's 6 points will help clarify some points about regarding standard times:

1. Standard times are necessary for costing and cost-estimating, and for scheduling and manpower allocation.

2a. A standard **time** is not a standard **time** unless all parties involved agree it is a standard **time** .

2b. Never use the word "accurate" when discussing standard times.
3. The more realistic your standard times, the more realistic your costing and scheduling.

4. Use the fastest, easiest work **measurement** technique that is consistent with the task being measured: motion analysis, **time** study, activity sampling, historical data, or estimates.

5a. constantly check to be sure the method being used is the same as the standard- **time** method.

5b. Change a standard **time** as more data becomes available for the task (such as historical data).

5c. Change a standard **time** whenever the method changes.

6. Use a computer.

I'm still looking for a clever three-letter buzz word to describe work-measured labor standards. On the other hand, maybe we should just leave it alone. Management techniques with clever buzz words usually have about a 5-year half-life. OK, no buzz words.
Editor's Note: Look for a list of work **measurement** software vendors as part of our comprehensive buyer's guide in the June issue.

Where Can I Find Standard Data?

Standard data are offered by some computer systems vendors for metal fabrication, sewing, clerical, printed circuit board assembly, maintenance, and a few other tasks. Many consultants have developed standard data for other clients they might share with you for a price. The Department of Defense has reams of almost-free, often ancient standard data on a large

variety of tasks.

But when you find the right standard data, it usually means you must buy a particular method--the same method they used to develop the standard data. Ask yourself some questions: Was the data developed using the same methods you already use, or with some other method of doing the tasks? Do you have access to the data development? Even if you can find standard data complete with the development evidence, you probably will have to go through it with a fine-toothed comb to be sure it applies to your business. Then you may be faced with the task of entering it into your computer system. To sum it up, this whole process is a worthy endeavor, but it more often than not leads to a dead-end.

Royal J. Dossett is president of Royal J. Dossett Corp., Excelsior, Minn. In addition to being the developer of MST and FAST, he currently coordinates seminars on computerized work **measurement** and labor standards.